C21.5:1060/4

Vol. 1060 Number 4 260

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November 26, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 26, 1985 Volume 1060 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority, all cases	750.00
International fees	
Basic fee (first 30 pages):	280.00
Basic Supplemental fee (for each page over 30):	6.00
Designation fee for the first 10 national or regional offices:	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Oct. 21, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Nov. 23, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,359,783 through 4,360,929
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,227,829, Re. S.N. 784,631, Filed Oct. 4, 1985, Cl. 405/20, SOIL EROSION PREVENTION BLOCKS, Kossuth J. Landry, Jr., Owner of Record: *Inventor,* Attorney or Agent: Guy E. Matthews, Ex. Gp.: 351

4,436,148, Re. S.N. 778,904, Filed Sept. 23, 1985, Cl. 166/53, CHEMICAL TREATMENT FOR OIL WELLS, Richard Maxwell, Owner of Record: *Inventor,*

Attorney or Agent: Robert C. Peterson, et al., Ex. Gp.: 356

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,815,213, Reexam. No. 90/000,881, Requested: Oct. 10, 1985, Cl. 29/446, METHOD OF MAKING AN IMPROVED SLOT DRAINAGE CULVERT, Ralph E. Evans, et al., Owner of Record: *Armco, Inc., Middletown, Ohio,* Attorney or Agent: Frost & Jacobs, Ex. Gp.: 320, Requester: American Corrugated Systems, Redding, Calif.

3,817,362, Reexam. No. 90/000,867, Requested: Sept. 20, 1985, Cl. 192/106.1, TORSION DAMPING DEVICE, Michel Rist, Owner of Record: *Societe Anonyme Francaise du Ferado, Paris, France,* Attorney or Agent: Young & Thompson, Ex. Gp.: 350, Requester: Valeo of Paris, Paris, France

3,943,997, Reexam. No. 90/000,801, Requested: June 14, 1985, Cl. 166/312, ROTARY DRILLING APPARATUS AND METHOD, Haggai D. Davis, Owner of Record: *Haggai D. Davis, Morgan City, La.,* Attorney or Agent: Jennings B. Thompson, Ex. Gp.: 350, Requester: Odeco, Inc., New Orleans, La.

4,038,753, Reexam. No. 90/000,877, Requested: Oct. 7, 1985, Cl. 433/11, ORTHODONTIC APPARATUS INCLUDING UNITARY DISPENSER AND DISPENSED ARTICLES, Paul E. Klein, Owner of Record: *Modcom, Inc., Canby, Oreg.,* Attorney or Agent: Kolisch, Hartwell, et al., Ex. Gp.: 330, Requester: Owner

4,163,923, Reexam. No. 90/000,879, Requested: Oct. 9, 1985, Cl. 315/208, VARIABLE DUTY CYCLE LAMP CIRCUIT, Dennis Herbers & William H. Gibson, Owner of Record: *Inventors,* Attorney or Agent: James D. Liles, Ex. Gp.: 250, Requester: Owners

4,217,686, Reexam. No. 90/000,878, Requested: Oct. 7, 1985, Cl. 29/413, ORTHODONTIC O-RING AND LIGATOR THEREFORE, William B. Dragan, Owner of Record: *Modcom, Inc., Canby, Oreg.,* Attorney or Agent: A. T. Fattibene, Ex. Gp.: 320, Requester: Owner

4,287,015, Reexam. No. 90/000,882, Requested: Oct. 16, 1985, Cl. 156/382, VACUUM BAG USED IN MAKING LAMINATED PRODUCTS, Harold J. Danner, Owner of Record: *Zip-Vac, Inc. Auburn, Wash.,* Attorney or Agent: Roy E. Mattern, Jr., Ex. Gp.: 130, Requester: Cosby M. Newsom, Norwalk, Calif.

4,330,280, Reexam. No. 90/000,880, Requested: Oct. 10, 1985, Cl. 433/90, EJECTOR HOLDER FOR CAPSULE-LIKE CARTRIDGE, Emery W. Dougherty, Owner of Record: *Dentsply Research Development Corp., Milford, Del.,* Attorney or Agent: C. Hercus Just, Ex. Gp.: 330, Requester: Dr. William B. Dragan, Stratford, Conn.

4,359,598, Reexam. No. 90/000,771, Requested: Apr. 26, 1985, Cl. 174/41, OVERHEAD ELECTRIC TRANSMISSION SYSTEMS, Phillip Dey, et al., Owner of Record: *BICC, Ltd., London, England,* Attorney or Agent: John A. Fogarty, Ex. Gp.: 210, Requester: Carl Kustin, Los Angeles, Calif.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decision having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,579,193, Donald R. Bernier, EDITING AND REVISION SYSTEM, Interference No. 99,564, decided July 19, 1985, claims 28–40.

Patent No. 4,206,872, Michael R. Levine, ELECTRONIC THERMOSTAT, Interference No. 100,874, decided July 13, 1984, claims 1–5, 7–9, 11–17.

Patent No. 4,261,762, Monroe L. King, METHOD FOR CONDUCTING HEAT TO OR FROM AN ARTICLE BEING TREATED UNDER VACUUM, Interference No. 101,164, decided Sept. 27, 1985, claims 1–4 & 6.

Patent No. 4,267,338, Jorg Stetter, Wilfried Draber, Rudolf Thomas and Winfried Lunkenheimer, N-AZOLYLALKYL-ANILINES, Interference No. 101,332, decided Oct. 7, 1985, claims 5, 15–20.

Patent No. 4,362,653, Delmar W. Robinson, HYDROCARBON CONVERSION CATALYST, Interference No. 101,226, decided Aug. 5, 1985, claims 1 & 2.

Patent No. 4,392,971, Hiroshi Kimura and Junjiro Kai, HEAT STORAGE MATERIAL, Interference No. 101,305, decided Aug. 20, 1985, claims 1 & 2.

Patent No. 4,393,258, Hisato Sato, Haruyoshi Takatsu, Yutaka Fujita, Masayuki Tazume, Kiyohumi Takeuchi and Hiroyuki Ohnishi, 1-CYCLOHEXYL-2-CYCLOHEXYLPHENYLETHANE DERIVATIVES, Interference No. 101,265, decided Sept. 24, 1985, claims 1–8.

Patent No. 4,401,798, Mario Q. Ceprini, Donald Goodman and Samuel Hoch, PROCESS FOR THE PRODUCTION OF VINYL HALIDE POLYMERS THAT USES AN ALKYL-SUBSTITUTED TRISPHENOL AS THE CHAIN-TERMINATING AGENT, Interference No. 101,363, decided Aug. 12, 1985, claims 1–6.

Patent No. 4,448,959, Beat Bohner, CHLOROSULFONYL UREA TRIAZINES, Interference No. 101,370, decided Aug. 12, 1985, claims 1–7.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals and Interferences.

Status of PTO Services

The following is an update of the status of PTO services for October 1985:

Service Item	FY 1985 Goal	FY 1986 Goal	Monthly Average
Filing Receipts:			
Patents	22	22	17
Trademarks	30	30	27
Patent/Trademark Copies:			
Special Window Coupons	1	1	99% within 1 day
Window Coupons	5	5	96% within 5 days
Mail Coupons	29	26	99% within 26 days*
Letter Orders	34	26	99% within 26 days*
Date of oldest unfilled order			Oct. 24, 1985
Current Mail Date being processed			Oct. 25, 1985
Certified Copies:			
Trademark Registrations	30	30	25
Applications-As-Filed	20	10	99% within 7 days
File-Wrapper/Contents	N/A	N/A	99% within 7 days
Walk-up Certification	1	1	99% within 24 hours
Trademark Search Library:			
Filing Pending Marks	21	21	25
Filing Reg. Certificates	3	Issue Date	On schedule
Assignments:			
Patents	25	20	20
Trademarks	25	20	17
Avg. Days from Issue Fee Payment to Issue Date	90–100	90–100	89
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	Issue Date	99% on Issue Date
Trademark Copies Available	Issue Date	Issue Date	99% on Issue Date

*Figures include postal processing and delivery time.

IMPROVEMENTS IN SERVICES

- *Patented Files Access* — We are greatly improving access and turn-around time for retrieval of many patented files. As a result of making additional space and shelving available, we are transferring patented files numbering 4,000,000 through 4,097,902 from the Federal Records Center at Suitland, Md., to our Eads Street File Repository. This should be completed by mid-Nov. Also, henceforth, no additional files will be sent to the Federal Records Center. Files there have been taking from 5 days to 2 weeks to retrieve. We are able to provide them from our File Repository within a day or two, if the file is not already checked out.

  This transition is a first step toward improving file access. We have further plans to bring all active patented files under our control by next spring.

  Slight delays may occur during transition, and we request your patience while these files are made more readily available. If you have any questions or require special assistance, please call Ms. Jacqueline Waldo on (703) 557–6944.

- *Electronic Copy Ordering* — We will introduce an electronic ordering service in Jan. 1986 for ordering copies of patents and trademarks. This will allow orders to be placed electronically to our copy fulfillment contractor, Vanguard Technologies Corp., eliminating the seven day average time for mail orders to be delivered from customers to us.

  The electronic ordering service will be available to deposit account customers who have a standard terminal with a modem. We will offer this service free of charge for a 90 day trial period. During this time, the only cost to the customer will be the standard per copy charge of $1.50 for patents, $1.00 for trademarks, and $6.00 for plant patents. These costs will be charged to the customer's deposit account. Near the end of the 90 day trial period, participants will be asked to complete an evaluation form on this service, and indicate whether or not they would be interested in continuing the service.

  If the trial is successful, those deposit account customers interested in continuing the service will be charged the costs of access and transmission charges for placing subsequent orders, in addition to the per copy charges. We estimate the access and transmission charges to be less than 25 cents per minute of connect time.

  Letters inviting participation in the trial will be sent to each deposit account customer soon. Those customers interested in using the service will be assigned a user identification code and given specific instructions on using the service by Vanguard.

  If you are interested in learning more about the service, please contact Mary Brown or Cathy Kern, Office of Patent and Trademark Services, on (703) 557–3236. They will be happy to assist you.

HELPFUL HINTS FROM THE PTO

- *Extensions of Time in Patent Cases* — Submission of the appropriate extension fee under 37 CFR 1.136(a) is to no avail unless a request or petition for extension is filed. Frequently, the request is omitted, which then requires an additional extension fee to cover the period to the date of the request. Occasionally, the application is held abandoned because the six month maximum statutory period has expired before detection of the omission of the request for extension. It is critical that a paper specifically requesting the extension be filed with late responses. It is also wise to use the Certificate of Mailing practice when requesting extensions.

  Extensions of time by fee payment under 37 CFR 1.136(a) are appropriate for filing of the Brief on Appeal in regular applications. No more than four months may be granted under 37 CFR 1.136(a). Beyond those four months, any further request must show sufficient cause under 37 CFR 1.136(b), and no additional extension fee is appropriate.

  An extension of time is not required in order to hold an interview with the examiner. However, an extension is required for the purpose of filing a follow-up amendment by applicant and/or for the entry of an Examiner's Amendment requiring approval of the applicant.

  Extensions of time are appropriate for the purpose of achieving continuity between parent and continuing applications. A separate paper requesting the extension of time must be filed in the *parent* application. It would be useful to file a *copy* of that request or petition with the papers constituting the filing of the continuing applicaiton.

- *Patent Copies* — The price of a patent copy increased from $1.00 to $1.50 on Oct. 5, 1985. The new $1.50 coupons are available, but we will accept the old ones and provide a $.50 coupon refund as appropriate.

- *Loose Documents in Patent Search Room* — When photocopies are made of patented files, patent applications and patents in the Public Search Room, we have noticed that papers from files and pages of patents have been left on the copy machines. In general, some documents are not returned to files and patents are not stapled and refiled in the bundles. File integrity can be enhanced if special care is taken to return properly all papers to files.

Nov. 5, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 26, 1985

B1. 4,342,811	4,496,758	4,519,439	4,533,006
4,130,413	4,499,068	4,520,212	4,533,052
4,146,558	4,499,325	4,520,292	4,533,447
4,211,872	4,499,427	4,520,780	4,533,940
4,243,721	4,499,654	4,522,097	4,534,191
4,327,022	4,499,690	4,522,412	4,534,211
4,343,023	4,500,434	4,522,954	4,534,318
4,348,965	4,500,949	4,522,957	4,534,755
4,356,142	4,501,042	4,523,374	4,534,826
4,365,347	4,502,397	4,523,847	4,534,834
4,372,629	4,503,140	4,524,854	4,534,906
4,373,103	4,504,386	4,525,146	4,534,976
4,373,206	4,505,976	4,525,702	4,534,980
4,380,947	4,507,118	4,525,839	4,535,267
4,383,113	4,507,406	4,526,225	4,535,392
4,413,792	4,507,887	4,526,463	4,536,012
4,419,672	4,508,249	4,526,716	4,536,105
4,428,649	4,508,615	4,526,778	4,536,333
4,429,115	4,508,858	4,527,099	4,537,121
4,435,879	4,509,465	4,527,250	4,537,134
4,438,971	4,510,227	4,528,123	4,537,361
4,449,301	4,511,831	4,528,127	4,537,987
4,450,812	4,512,311	4,528,163	4,538,089
4,453,998	4,513,222	4,528,474	4,538,414
4,468,877	4,514,165	4,528,529	4,538,827
4,472,832	4,514,398	4,528,756	4,538,944
4,473,435	4,514,434	4,530,064	4,539,208
4,473,826	4,514,661	4,530,174	4,539,724
4,476,659	4,514,959	4,530,377	4,539,763
4,477,274	4,515,592	4,530,699	4,539,929
4,478,963	4,515,943	4,530,715	4,540,115
4,482,842	4,516,841	4,530,818	4,540,423
4,489,801	4,517,007	4,530,870	4,540,487
4,490,690	4,517,192	4,531,598	4,540,645
4,491,917	4,517,317	4,531,602	4,540,891
4,493,828	4,517,323	4,531,681	4,540,935
4,495,069	4,518,320	4,532,307	4,541,325
4,495,557	4,518,586	4,532,579	4,543,468
4,495,865	4,518,608	4,532,682	
4,495,908	4,518,759	4,532,845	
4,496,553	4,518,904	4,532,964	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 26, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-14-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	8-06-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-30-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-14-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during October 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,403,406 to 3,408,656, inclusive

Plant Patents . . . . . Numbers 2,835 to 2,843 inclusive

REEXAMINATIONS

NOVEMBER 26, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,401,624 (426th)

BUFFERED SOLUTIONS WHICH HAVE A REDUCED CORROSIVE NATURE

Charles B. Atwater, Palo Alto, Calif., assignor to Syntex Inc., Palo Alto, Calif.

Reexamination Request No. 90/000,627, Sep. 13, 1984.
Reexamination Certificate for Patent No. 4,401,624, issued Aug. 30, 1983, Ser. No. 355,493, Mar. 8, 1982.
Filed Sep. 13, 1984, Ser. No. 355,493
Int. Cl.[4] **A21D** *2/14;* **A23B** *4/12;* **C23F** *11/12*
U.S. Cl. 422—12

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–5** are now disclaimed.

1. A method for reducing the corrosion of metals in contact with an aqueous solution of a carboxylic acid which comprises maintaining said metal in contact with an aqueous solution of:

(a) about one equivalent of a metal salt of a carboxylic acid having the formula $R'C(O)O^-+M$;

(b) about one equivalent of a carboxylic acid having the formula $R''C(O)OH$; and

(c) water to produce an aqueous solution containing about 40 to about ƧƆ percent by weight of a compound having the formula $R'C(O)O^-+M.R.''C(O)OH$

wherein

R′ and R″ are independently selected from the group consisting of methyl, ethyl, propyl, iso-propyl, butyl, iso-butyl, tert-butyl and benzyl; and

M is selected from the group consisting of sodium, potassium, and calcium.

REISSUES

NOVEMBER 26, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,036

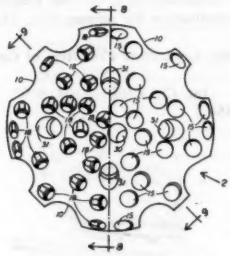
DRILL BIT

Mahlon Dennis, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Original No. 4,323,130, dated Apr. 6, 1982, Ser. No. 158,389, Jun. 11, 1980. Application for reissue Mar. 30, 1984, Ser. No. 595,269

Int. Cl.[4] **E21B** *10/46*

U.S. Cl. 175—329 **18 Claims**



18. A cutting element for use in a drill bit of the type comprising a drill body and recess means therein for receiving said cutting element, said cutting element comprising a cylindrical supporting stud of sintered carbide having an angularly oriented supporting surface with a disc-shaped element bonded thereon comprising a sintered carbide disc having a cutting surface comprising a polycrystalline diamond, said disc-shaped element on said cutting element having a peripheral bevel on said diamond cutting surface.

Re. 32,037

METHODS FOR MANUFACTURING CEMENTITIOUS REINFORCED PANELS

Theodore E. Clear, 429 S. Washington Blvd., Hamilton, Ohio 45013

Original No. 4,203,788, dated May 20, 1980, Ser. No. 887,324, Mar. 16, 1978. Application for reissue May 19, 1982, Ser. No. 379,937

Int. Cl.[4] **B32B** *31/12, 13/14;* **B28B** *1/08*

U.S. Cl. 156—44 **2 Claims**

33. A method for manufacturing a cementitious panel web useful for forming cementitious panels of the type having a nailable cementitious aggregate core faced on each major side with a reinforcing element bathed in a slurry comprising hydraulic cement, the method of forming the web comprising the steps of:

running a first elongated indefinite length web of reinforcing material through a slurry bath and depositing said slurry thereto to form a first uncured flexible cementitious element;

metering the amount of slurry deposited on said first web;

dragging an upper surface of said web against a bar to force slurry into said web, while leaving slurry on said upper surface;

depositing cementitious aggregate core material on said uncured flexible cementitious element;

running a second elongated indefinite length web of reinforcing material through a second slurry bath, and depositing slurry thereto to form a second uncured flexible cementitious element;

metering the amount of slurry deposited on said second web;

dragging an upper surface of said second web against a bar to force slurry into said second web, while leaving slurry on said upper surface; and

laying the second element on said core material;

thereby adhering the elements to respective major sides of said aggregate core material to form an uncured web from which individual panels can be thereafter formed.

Re. 32,038

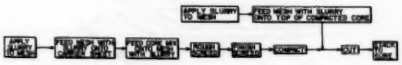
METHODS FOR MANUFACTURING CEMENTITIOUS REINFORCED PANELS

Theodore E. Clear, 429 S. Washington Blvd., and Paul E. Dinkel, 645 Hamilton-New London Rd., both of, Hamilton, Ohio 45013

Original No. 4,203,788, dated May 20, 1980, Ser. No. 887,324, Mar. 16, 1978. Application for reissue May 19, 1982, Ser. No. 379,936

Int. Cl.[4] **B32B** *31/12, 13/14;* **B28B** *1/08*

U.S. Cl. 156—44 **28 Claims**



1. A method for manufacturing cementitious panels of the type having a nailable cementitious aggregate core faced on each major side with a reinforcing element bathed in a slurry comprising hydraulic cement, the method comprising the steps of;

running an elongated indefinite length web of pervious reinforcing material through a slurry bath and depositing an amount of slurry thereto to form a first wet uncured flexible cementitious element;

depositing cementitious aggregate core material on said uncured flexible cementitious element;

running a second elongated indefinite length web of pervious reinforcing material through a second slurry bath, and depositing an amount of slurry thereto to form a second wet uncured flexible cementitious element;

laying the second element on said core material;

thereby adhering the elements to respective major sides of said aggregate core material to form an uncured panel web;

thereafter cutting said uncured panel web to form separate uncured cementitious panels; and thereafter curing said panels.

Re. 32,039

THERMAL AND MECHANICAL BARRIER LAYERS FOR OPTICAL RECORDING ELEMENTS

Kenneth R. Hollister, Pittsford, and Harold T. Thomas, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

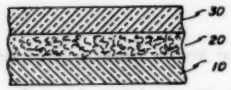
Original No. 4,340,655, dated Jul. 20, 1982, Ser. No. 160,809, Jun. 18, 1980. Application for reissue Aug. 31, 1984, Ser. No. 646,195

Int. Cl.[4] **G03E** *1/76;* **G01D** *15/10;* **G11B** *7/24*

U.S. Cl. 430—14 **18 Claims**

1. In a recording element comprising a support having thereon a heat-deformable optical recording layer and, coated

on said recording layer, a substantially transparent thermal and mechanical barrier layer, the improvement wherein said bar-



rier layer comprises a water-soluble polymer *other than poly(acrylamide)* having a T_g when dry of at least 100° C.

Re. 32,040

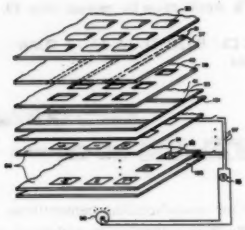
CALCULATOR APPARATUS WITH ELECTRONICALLY ALTERABLE KEY SYMBOLS

Alan S. Bagley, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Original No. 4,078,257, dated Mar. 7, 1978, Ser. No. 716,867, Aug. 23, 1976. Application for reissue Feb. 25, 1980, Ser. No. 124,418

Int. Cl.[4] G06F *3/02, 7/38*

U.S. Cl. 364—900 **10 Claims**



20. A keyboard having at least one keyboard configuration of alphanumeric symbols disposed as energizeable elements on at least one plane, said keyboard being responsive to means for selecting at least two modes of operation, means for selecting a keyboard configuration by energizing selected ones of the elements and means for displaying the selected configuration, said keyboard comprising:

a cover portion with at least one labeled key and a plurality of transparent unlabeled key regions, the at least one labeled key being disposed for initiating the selection of a configuration of alphanumeric symbols during a first mode, to electronically label the unlabeled key regions;

a conductive portion disposed below said cover portion and having a first transparent portion located below said transparent unlabeled key regions; and

a display portion disposed below said conductive portion and having a second transparent portion located below said first transparent portion, said second transparent portion having at least one substantially transparent plane with the plurality of energizable elements for producing and displaying through said transparent regions and portions at least one configuration of alphanumeric symbols, the electronically labeled key regions and the labeled keys being actuable during a second mode for making keyboard entries indicated by their labels.

Re. 32,041

CONTROL VALVE FOR VISCOUS MATERIAL PUMPS

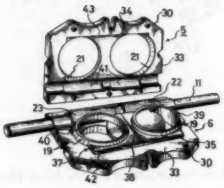
Horst Heckmann, Sprockhövel, and Werner Nawroth, Waltrop, both of Fed. Rep. of Germany, assignors to Friedrich Wilh. Schwing, GmbH, Herne, Fed. Rep. of Germany

Original No. 4,392,510, dated Jul. 12, 1983, Ser. No. 429,020, Sep. 30, 1982. Continuation of Ser. No. 236,568, Feb. 20, 1981, abandoned. Application for reissue Aug. 15, 1984, Ser. No. 641,009

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006542

Int. Cl.[4] F16K *27/04, 3/00*

U.S. Cl. 137—454.2 **44 Claims**



21. A wear shell for use in a control valve of a viscous material pump which has a flat housing having a pair of generally parallel exterior surfaces and a pair of laterally spaced viscous material channels extending therethrough normal to the exterior surfaces and being formed of two parts abutting along a joinder plane lying parallel to the exterior surfaces, and which has a valve slide in the housing having a valve plate fastened to a valve rod for reciprocal movement within the housing across one or the other of the material channels thereof for controlling the movement of material through the channels, the wear shell comprising:

a pair of generally similar wear shell halves for mounting in the valve housing and containing the valve plate with the valve rod extending therefrom, the wear shell halves being divided along a central plane lying normal to the movement of the valve slide and being assemblable to form the wear shell by threading them on opposite ends of the valve slide, the wear shell being formed for permitting the reciprocal movement of the valve slide and having a pair of openings aligned with the material channels in the housing, and the wear shell being retained in the housing by locking engagement with the interior of the housing and having annular projections around the openings extending into the material channels for lining same.

PATENTS

GRANTED NOV. 26, 1985

ERRATA

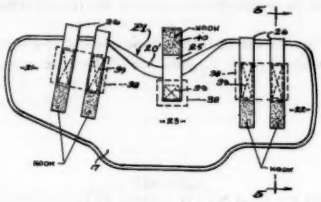
For CLASS	See PATENT NO.
70–312	4,554,809
122–026	4,554,906
604–010	4,554,918
514–017	4,555,403
514–201	4,555,404
514–488	4,555,405
514–605	4,555,406

PATENTS

GRANTED NOVEMBER 26, 1985

GENERAL AND MECHANICAL

4,554,681
REPLACEABLE SHOULDER PADDING FOR FOOTBALL AND THE LIKE
Alvin E. Kirkland, Playa Del Rey, Calif., assignor to Conlin Bros., Inc., Whittier, Calif.
Filed Jun. 11, 1984, Ser. No. 619,574
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **22 Claims**



1. Athletic gear and the like with quickly replaceable padding, and including in combination;

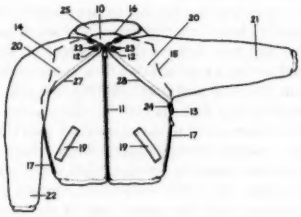
a protective structural member formed to overlie a part to be protected and having an edge positioned and shaped to form a bitt,

a protective pad of depressible material formed to be disposed between the interior of the structural member and the part to be protected and engageable therewith,

at least one flexible strap anchored to the pad and having a free end portion turned tightly over the bitt to form a bite and establish a primary securement means to hold the pad,

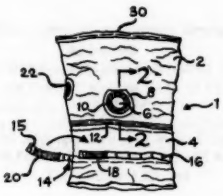
and the free end portion of the strap having hook-and-loop fastener means releasably holding said portion contiguous to the exterior of the structural member and thereby establishing the securement of a secondary securement means.

4,554,682
CONVERTIBLE JACKET
Paul A. Hillquist, R.D. 2, Box 2760, Bryant Pond, Me. 04219
Filed Apr. 5, 1984, Ser. No. 597,045
Int. Cl.[4] A41B *1/12*; A41D *1/04*
U.S. Cl. 2—70 **4 Claims**



1. An upper component of an outergarment comprising, as a unit, two sleeve portions connected by a yoke portion incorporating a neckhole, said upper component being adapted to selective external attachment to a sleeveless body garment or vest and being so configured as to substantially cover body areas above the lower edge of the armholes of said vest, whereby said upper component is a means for selectively converting said vest to a jacket with multiple layers of construction substantially covering the upper back and shoulder area of the body.

4,554,683
PROTECTIVE ENCLOSURE HAVING SELF-CONTAINED AIR SUPPLY
Albert H. Wong, Los Angeles, Calif., assignor to Wong Technology, Inc., Los Angeles, Calif.
Filed Jan. 21, 1981, Ser. No. 226,920
Int. Cl.[4] A42B *1/04*
U.S. Cl. 2—202 **8 Claims**



1. A flexible protective enclosure to protect a wearer from suffocation due to the presence of smoke and similar noxious fumes within a contaminated environment, said enclosure being closed at the top end thereof and being opened at the bottom end thereof so that said enclosure can be positioned over the head of the wearer,

said enclosure top end being closed by a relatively rigid closure member comprising a seal by which the top edges of said enclosure are connected together, said seal extending across said enclosure top end, so that the corners thereof are substantially square for separating said top end from the head of the wearer,

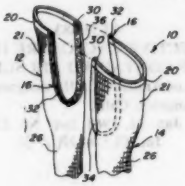
said enclosure including a pair of arm ports established therethrough and elastic sleeves aligned with respective arm ports at the interior of said enclosure for receiving the arms of the wearer therepast and for making an airtight seal therearound,

said enclosure extending from above the head to the trunk at a location below the shoulders of the wearer and having fastening means by which to secure said enclosure to the wearer, such that said enclosure is spaced away from the wearer's head and trunk, so as to produce an airspace therearound in which a temporary supply of air is contained, said enclosure operating to prevent fluid communication between the contaminated environment and said airspace so that the wearer may breathe from said airspace while within the contaminated environment.

4,554,684
MEN'S COMBINATION BRIEFS AND HOSE
Genevieve L. Cadoret, c/o Papin, 306 W. 91st St., New York, N.Y. 10024
Filed Oct. 17, 1983, Ser. No. 542,420
Int. Cl.[4] A41D *1/06*; A41B *9/00*
U.S. Cl. 2—227 **5 Claims**

1. A pants garment comprising two identical portions each one of which can be used as a right side portion and a left side portion wherein identical mating fastener means are applied to both said portions such that each portion may mate with the other to form an entire garment but when said right side portion and said left side portion are separated they are identically indistinguishable from each other, wherein said mating fastener means comprises strips of loop fastener material which engage corresponding strips of hook fastener material, said mating fastener means being coupled on each portion along an arcuate path extending along the crotch and seat areas begin-

ning and terminating at the waist, a strip of loop fastener material extending halfway along said arcuate path and a strip of



hook fastener material extending the other halfway along said arcuate path.

4,554,685

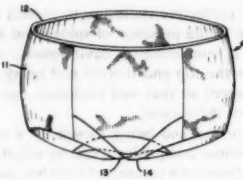
UNDERWEAR

Hugh C. Ray, Rte. 1, Box 197, Cusseta, Ala. 36852

Filed Mar. 2, 1984, Ser. No. 585,533

Int. Cl.[4] A41B *9/02*

U.S. Cl. 2—403 **13 Claims**



1. In a garment of the type having a waist opening and two leg openings for covering the lower torso of the wearer, the improvement comprising:

a body member for covering the rear and both sides of the lower torso;

a first leg shield secured to a first front-most edge of said body member, extending around the inner surface of a first leg of the wearer and secured to the rear bottom portion of said body member;

a second leg shield secured to a second front-most edge of said body member, extending around the inner surface of a second leg of the wearer and secured to the rear bottom portion of said body member; wherein each leg shield has a straight front edge, concave lower edge, a convex rear edge, and an upper edge having an elongated straight portion and a portion which curves to generally perpendicular to said elongated straight portion; and

at least one front panel connected to the front-most portions of said body member and connected to the rear bottom edge of said body member, thereby forming a compartment between said leg shields;

further provided that contact between the inner surface of the wearer's leg and the scrotum and penis is prevented.

4,554,686

POLYMETHYLMETHACRYLATE BONE CEMENTS AND METHODS FOR PREPARING SUCH BONE CEMENTS

Charles D. Baker, Lehi, Utah, assignor to Technical Research Associates, Inc., Salt Lake City, Utah

Filed Feb. 29, 1984, Ser. No. 584,605

Int. Cl.[4] A61F *1/00;* **B05D** *3/06;* **C08F** *6/02*

U.S. Cl. 623—16 **41 Claims**

1. A method for preparing polymethylmethacrylate bone cement for use in attaching a surgical prosthesis to prepared bone tissue, the method comprising the steps of:

mixing a bone cement composition including methylmethacrylate with a composition capable of initiating a polymerization of the methylmethacrylate;

blending the bone cement composition until a desired degree of partial polymerization has occurred;

placing substantially free flowing partially polymerized bone cement into syringe means;

freezing the partially polymerized bone cement in order to substantially arrest polymerization of the methylmethacrylate in the bone cement composition;

irradiating the frozen bone cement with suitable electromagnetic radiation capable of sterilizing the frozen bone cement without inducing substantial amounts of polymerization of the methylmethacrylate in the frozen bone cement; and

storing the sterilized, frozen bone cement at a temperature below about −70° C. until use of the bone cement.

4,554,687

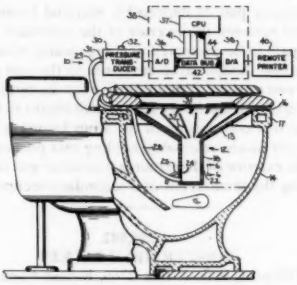
TOILET MOUNTED URINE FLOW METER

Garry L. Carter, and Vaughan B. Weeks, both of Racine, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Continuation-in-part of Ser. No. 450,677, Dec. 17, 1982, abandoned. This application Nov. 26, 1984, Ser. No. 674,561

Int. Cl.[4] A47K *11/00;* **G01F** *1/20*

U.S. Cl. 4—144.2 **4 Claims**



1. A disposable collector to be used in a urine flow meter for measuring the flow rate of a stream of urine as it is voided into the collector, comprising:

a lower neck portion having an open upper end and a substantially closed lower portion, said lower portion having a first aperture formed therein which is sized and positioned so that a typical urine flow causes urine to accumulate in the neck portion above the first aperture until the pressure at the first aperture causes a urine flow out the neck portion equal to the urine flow into the collector;

an upper mouth portion having walls which slope downwardly and inwardly from an open upper end to an open lower end, said lower end of the mouth portion being coextensive with the upper end of the neck portion to funnel the stream of urine into the neck portion;

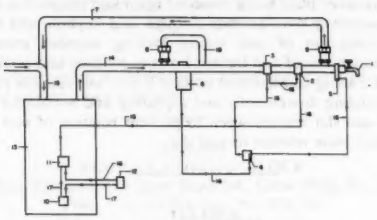
a pressure sender having a lower end in communication with the lower portion of the neck portion below the aperture and an upper end above the neck portion suitable for connection to a pressure transducer so that urine collected in the neck portion produces an air pressure in the pressure sender which is sensed by the pressure transducer; and

wherein the collector is dimensioned to be supported within a toilet bowl so that urine collected in the neck portion drains from the aperture into the toilet bowl.

4,554,688
WATER SAVING SYSTEM

Thomas J. Puccerella, 111 Chippewa St., Miami Springs, Fla. 33166

Filed Apr. 17, 1984, Ser. No. 580,789
Int. Cl.[4] E03C *1/00*
U.S. Cl. 4—191 4 Claims

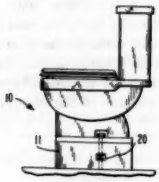


1. A water saving system comprising
(a) a water treatment apparatus;
(b) a delivery line extending from said water treatment apparatus to an outlet faucet;
(c) a recirculating line extending upstream of said faucet from a point closely adjacent thereto back to said water treatment apparatus;
(d) a recirculating pump interposed in said delivery line;
(e) temperature sensing means in said delivery line immediately upstream of said faucet;
(f) control means for operating said pump when the temperature of the water in said delivery line immediately upstream of said faucet, as detected by said sensing means, is below a predetermined desired delivery temperature;
(g) a thermostatically controlled valve disposed in said delivery line immediately upstream of said faucet;
(h) said control means also being associed with said thermostatically controlled valve to open said valve only when the temperature in said delivery line immediately upstream of said faucet is at said predetermined temperature.

4,554,689
STRENGTH SAVER COMMODE

Calvin A. Segler, 4110 Loma Alta Rd., Corpus Christi, Tex. 78410

Filed Feb. 8, 1985, Ser. No. 699,943
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—254 1 Claim

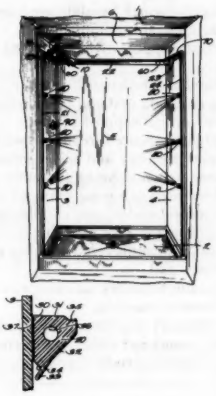


1. A strength saver commode, comprising, in combination, a block and a conventional commode for being mounted upon said block, and means for securement thereof together and for securement of said block upon the floor of a house; said block having a length and width contoured to fit an edge of a flange around a base of said commode, and a vertical opening through said block having a drain pipe therethrough for said commode; and said securement means comprising a recess on each opposite side of said block, each said recess being approximately midway between the top and bottom of said block, a pair of aligned vertical openings communicating through each said recess, an upper of said openings extending to said block top while a lower of said openings extends to said block bottom, a bolt in each said opening, said bolt in said upper opening having a head bearing against the top surface of said flange, a plate mounted in said floor, said bolt is said lower opening extending also through said plate and having its head bearing against an underside of said plate, and a threaded opposite end of each said bolt terminating within said recess and being fitted with a threaded nut.

4,554,690
WATER DISTRIBUTION SYSTEM FOR SHOWERS

Scott R. Knapp, and Paul P. Kolada, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.

Filed Oct. 18, 1984, Ser. No. 662,318
Int. Cl.[4] A47K *3/22*
U.S. Cl. 4—601 3 Claims



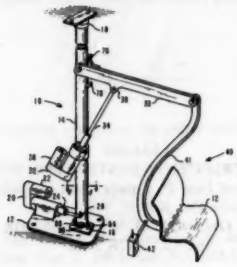
1. A water distribution system for a shower enclosure of the type having a pair of opposed walls connected by a third wall and a shower nozzle inside the enclosure connected to a water supply pipe, comprising in combination:
(I) at least a pair of water channels attached to interior surfaces of the walls of the shower enclosure,
each water channel consisting of an extruded plastic longitudinal element including a longitudinally-extending water passage defined internally thereof and a wall adhesively attached to interior wall surfaces of the enclosure;
(II) the water channels being arranged at about right angles to each other with one channel positioned horizontally and the other positioned either vertically or horizontally with an end of one channel spaced from an end of another channel at a corner between the channels,
a flexible water conduit connected to the water passage of each channel between said spaced ends for conducting water from one channel to the other;
(III) a covering clip having a pair of legs and arranged to cover said flexible conduit with one leg of the covering clip secured to one channel at the corner and the other leg secured to the other water channel at the corner;
(IV) conduit means connected to at least one of said channels for supply of water thereto from inside the enclosure; and
(V) shower attached to at least one of said water channels and communicating with the water passage thereof for direct water onto a bather.

4,554,691

PATIENT LIFTING APPARATUS

Robert O. Daugherty, R.R. #9, Box 46, Nip St., West Acres Addition, Muncie, Ind. 47302

Filed Nov. 2, 1983, Ser. No. 547,981
Int. Cl.[4] B66C *23/16*
U.S. Cl. 5—81 R **17 Claims**



1. Lift apparatus by which invalids are translated into various positions, said apparatus comprising:

a rotatable vertical support member having a vertical longitudinal axis;

a vertically rotatable cantilevered member having a first end and a second end, said first end being rotatably secured to said rotatable vertical support member;

a first linear actuator secured to and between said rotatable vertical support member and said cantilevered member, said first linear actuator being rotatably secured to said cantilevered member at a point between the said first end and the said second end of said cantilevered member;

a remote control apparatus for effecting selective varying of the position of said cantilevered member and said vertical support member; and

a transport apparatus rotatably connected to said second end of said cantilevered member,

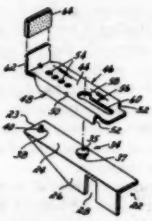
whereby said transport apparatus may be elevated and circumferentially translated about the vertical longitudinal axis of said rotatable vertical support member.

4,554,692

ADJUSTABLE BOX SPRING RETAINER BRACKET

Larry W. Whitehead, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Dec. 13, 1984, Ser. No. 681,500
Int. Cl.[4] A47C *19/02*
U.S. Cl. 5—411 **5 Claims**



1. An adjustable retainer bracket for retaining bedding foundations on a pedestal bed base, said pedestal bed base including spaced side rails and at least one cross slat mounted to said side rails having a horizontal leg formed with side edges and a bore at each end, said adjustable retainer bracket comprising:

a retainer plate formed with a horizontal web, a pair of spaced vertical legs connected to each side of said horizontal web, an upright end section connected to one end of said horizontal web, and a plurality of spaced locator holes and a keyhole formed in said horizontal web;

an upstanding shouldered rivet mounted to said horizontal leg of said slat;

a spring locking member having a locking pin at one end, said spring locking member being mounted to the underside of said horizontal leg of said slat so that said locking pin extends through said bore therein;

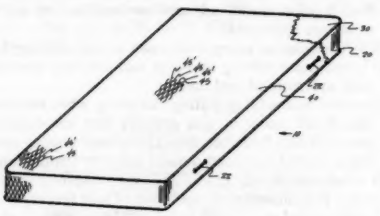
said retainer plate being mounted upon said slat so that said upstanding rivet extends through said keyhole and said locking pin of said spring locking member extends through one of said locator holes to position said retainer plate along said slat, said vertical legs of said retainer plate extending downwardly and capturing said horizontal leg of said slat therebetween to prevent rotation of said retainer plate relative to said slat.

4,554,693

MATTRESS, BOX SPRINGS FABRIC

Brian Calloway, Moore, S.C., assignor to American Fast Print Limited, Spartanburg, S.C.

Filed Dec. 19, 1983, Ser. No. 563,167
Int. Cl.[4] A47C *27/00*
U.S. Cl. 5—448 **21 Claims**



1. A body support element having non-slip surface characteristics comprising:

(a) a frame,

(b) support means within said frame;

(c) ticking fabric secured about at least a portion of said frame, said ticking fabric comprising a base knit structure having adequate strength when on said element to support a human body in a supine position, said base knit structure having a plurality of first yarns laid atop same and secured thereto, said first top yarns residing above said base structure and following a non-linear path therealong and a plurality of second yarns laid atop said base structure and secured thereto, said second yarns residing above said base structure and following mirror image paths to said first lay in yarns whereby frictionally resistive forces are present across the surface of the element.

4,554,694

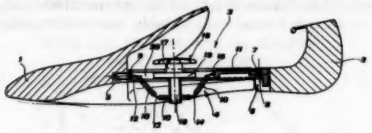
EXTENSIBLE SHOE SHAPER

Angelo Tradigo, and Francesco Tradigo, both of Milan, Italy, assignors to Giovanni Tradigo S.n.c., Italy

Filed Mar. 7, 1984, Ser. No. 586,984
Claims priority, application Italy, Mar. 9, 1984, 19982 A/83
Int. Cl.[4] A43D *3/14, 3/00*
U.S. Cl. 12—136 B **4 Claims**

1. Extensible shoe shaper having a front toe part and a rear heel part, characterized in that, the connection between the front part and the rear part is obtained by means of a kinematic hinge element formed of a single strip of material of varying thickness, wherein the hinge function is performed by portions

of reduced thickness of the strip of material, and the configuration of the hinge element can be varied by means of a screw



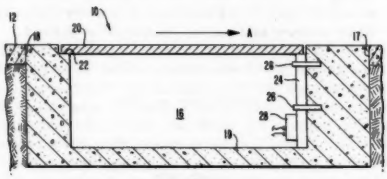
handwheel which is slidably fixed along one of said parts and acting on said hinge element.

4,554,695

VEHICULAR ROAD BLOCK

W. Ross Rowland, 639 River Bend Rd., Great Falls, Va. 22066

Filed Feb. 3, 1984, Ser. No. 576,706
Int. Cl.[4] E01D *1/00;* **E01F** *13/00*
U.S. Cl. 14—69.5 **18 Claims**



1. A road block for preventing the entry of selected vehicles into a secured area via a road, comprising:

a pit defined in part by a trailing wall on a trailing end of the pit with respect to the direction of vehicle access and a leading wall on a leading end of the pit, the pit having a width greater than the width of the selected vehicles;

means for supporting vehicles above the pit at a level even with the surface of the road during normal operating conditions, the supporting means comprising a span of predetermined length and of width narrower than the width of the pit, an abutment support supporting the leading end of the span and at least one collapsible support member supporting the trailing end of the span; and

means for effecting free fall of the vehicle supporting means into the pit by collapsing the support member in response to a selected vehicle approaching the pit, whereby the trailing end of the span falls into the pit, directing the vehicle toward impact against the trailing wall of the pit.

4,554,696

GOLF CLUB GRIP CLEANER

Gerald P. Nye, Jr., 4940 Cloister Dr., Rockville, Md. 20852

Filed Nov. 16, 1984, Ser. No. 672,474
Int. Cl.[4] A63B *57/00;* **A46B** *13/04*
U.S. Cl. 15—21 D **8 Claims**

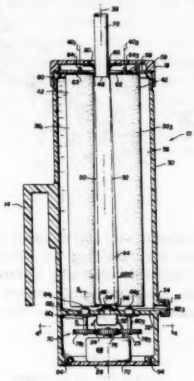
1. An apparatus for cleaning the grip of a golf club comprising:

an upright elongated housing including a coextensive chamber adapted to be filled with a cleaning liquid to a level substantially completely submerging the hand grip of a golf club inserted into the housing;

circumferentially spaced parallel axis substantially cylindrical rotary golf club grip scrubbing brushes journaled in the housing and being spaced equidistantly from the center of the housing to define a center golf club grip cleaning space in the housing surrounded by said brushes, the brushes extending substantially for the entire depth of the housing and being substantially completely submerged in a cleaning liquid filling the chamber;

power means located in a chamber forming an extension of said housing, said power means being connected with the brushes to rotate them in unison on their parallel axes;

a removable closure cap for the top of the housing having a centr golf club grip insertion and removal opening in



coaxial alignment with said central golf club hand grip cleaning space; and

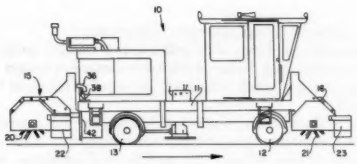
means secured to said housing for mounting the apparatus in a use position.

4,554,697

BALLAST BROOMS

Calvin L. Coy, Chapin, and Keith T. O'Neal, Columbia, both of S.C., assignors to Canron Corp., West Columbia, S.C.

Filed Nov. 16, 1983, Ser. No. 552,244
Int. Cl.[4] E01H *8/10*
U.S. Cl. 15—55 **3 Claims**



1. A railroad track ballast broom machine comprising a wheeled machine frame; a first broom unit operatively mounted on said frame and spaced rearwardly thereof; a second broom unit operatively mounted on said frame forwardly thereof; said broom units including a substantially cylindrical broom means mounted in each unit so as, in operation, to transversely span the railroad track and a deflector box located forwardly of each said broom means; and means to translate said first broom unit transversely of said machine frame.

4,554,698

DISPENSING ARRANGEMENT FOR AN UPRIGHT VACUUM CLEANER

David B. Rennecker, Canton, and Walt S. Taylor, North Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Jul. 9, 1984, Ser. No. 629,108
Int. Cl.[4] A47L *7/04*
U.S. Cl. 15—339 **17 Claims**

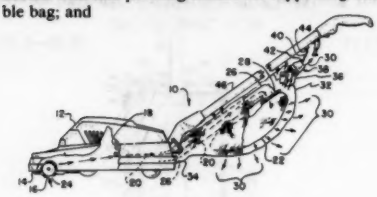
1. An upright vacuum cleaner comprising:

a pivoting handle;

a flexible bag formed of air pervious material and extending along said pivoting haandle;

air flow generating means for producing an air flow through said flexible bag;

a cap member attached to said flexible bag and interconnected with said pivoting handle for supporting said flexible bag; and



a dispenser located in said cap member including accommodating means for retaining an odorizing material and means for selectively directing a portion of the air flow through said accommodating means for dispensing an odorizing material being retained thereby.

4,554,699

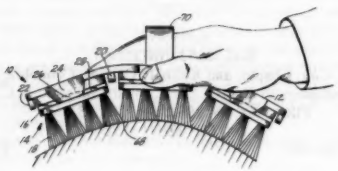
FLEXIBLE BRUSH

Stanley J. Simmons, 408 Lotone, Monrovia, Calif. 91016

Filed Mar. 26, 1984, Ser. No. 593,718

Int. Cl.[4] A46B *9/10, 17/02*

U.S. Cl. 15—201 **10 Claims**



1. A flexible brush apparatus comprising:

a plurality of brush elements having bristles embedded in and extending outward from one surface of a rigid backing and having holding means at the sides of the rigid backing; and

a fully flexible brush element holder having a plurality of pair gripping elements extending outward from one surface of the holder, the holder and gripping elements adapted, by virtue of their flexibility, to releasably grip, from the surface of the rigid backing opposite of the bristles, opposite sides of the brush element's rigid backing at the holding means to provide an arrangement of adjacent brush elements which can be manipulated so that the free end of the bristles can apply a brushing action to surfaces with a variety of contours.

4,554,700

INVISIBLE HINGE MEANS FOR LID AND HOOD OF A CANISTER VACUUM CLEANER

John B. Lyman, Bloomington, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 16, 1984, Ser. No. 641,284

Int. Cl.[4] A47L *90/00*

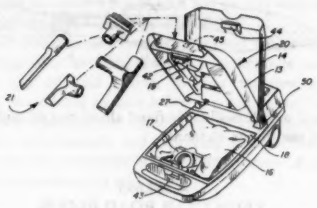
U.S. Cl. 15—323 **26 Claims**

1. In an appliance having a body defining a first receptacle and a wall portion at one edge portion of the receptacle, the improvement comprising:

arcuate guide means on said body;

a first lid for covering said receptacle, said first lid defining a second receptacle and having arcuate slide-track means, said slide-track means defining an arcuate first slide slidably received in said arcuate guide for selective swinging of said first lid about an axis defined by said guide means, said slide-track means further defining an arcuate track concentric to said axis; and

a second lid for covering said second receptacle and having an arcuate second slide slidably received in said arcuate



track for selective swinging of said second lid relative to said first lid, whereby said first and second lids may be swung as a unit to uncover said first receptacle and said second lid may be selectively swung away from said first lid to uncover said second receptacle as desired.

4,554,701

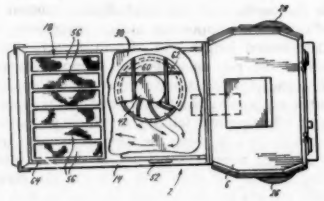
VACUUM STREET SWEEPER AND FILTER APPARATUS THEREFOR

Karel W. M. Van Raaij, 1800 AG Alkmaar, Netherlands

Filed Feb. 10, 1984, Ser. No. 579,167

Int. Cl.[4] E01H *1/08;* **B01D** *50/00*

U.S. Cl. 15—340 **21 Claims**



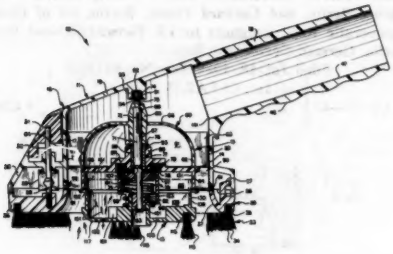
1. A vacuum street sweeper comprising a body, wheels for supporting the body and allowing movement of the sweeper along a street, a hopper within the body for receiving debris, an inlet to the hopper, a hopper outlet from the hopper, an exhaust section within the body communicating with the outlet, an exhaust outlet from the exhaust section, a vacuum system blower means supported within the exhaust section for suctioning debris through the inlet and into said hopper, initial filter means in said hopper upstream of said hopper outlet for filtering relatively coarse debris particles while allowing air carrying relatively fine dust and the like to pass therethrough, secondary filter means in the exhaust section remote from the initial filter means and positioned and arranged to filter dust and the like prior to the air exiting the exhaust outlet, the blower means being in flow communication with the hopper outlet and being positioned and arranged with respect to the exhaust outlet so as to discharge air through the secondary filter means whereby the blower means causes air flow through the initial filter means, through the hopper outlet, the secondary filter means, and the exhaust outlet.

4,554,702

VACUUM DRIVEN TOOL

Werner W. Kochte, Ravenna, and Susan K. Nimon, Cuyahoga Falls, both of Ohio, assignors to The Scott & Fetzer Company, Twinsburg, Ohio

Filed Aug. 10, 1984, Ser. No. 639,956
Int. Cl.[4] A47L *9/04*
U.S. Cl. 15—372 8 Claims



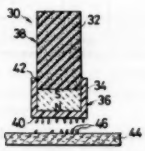
1. A vacuum rotary sweeper comprising a housing having an air inlet and an air outlet, a rotary disc brush having a central axis and supported by the housing adjacent the inlet for rotation about said axis, a turbine wheel rotatably supported in the housing rearwardly of the disc brush for rotation about said axis, means rotationally coupling the disc brush to the turbine wheel, the housing having an interior peripheral surface area encircling a portion of the axial zone from the disc brush to the turbine wheel, a generally annular surface element axially inward of the disc brush and spaced radially inward of said housing interior peripheral surface, said housing interior peripheral surface and annular surface element mutually forming an annular flow passage for air passing between the inlet and outlet, a stator having a plurality of peripherally spaced blades for directing air flow to the turbine wheel in a spiral direction, a hollow cavity generally enclosed by a portion of some of said disc brush, annular surface element and turbine wheel, said disc brush being in telescoped relation with said annular surface element, and means resiliently biasing said disc brush forwardly relative to said annular surface element.

4,554,703

MAGNETIC ERASER DUST COLLECTOR

Shouzo Matuki, Takasaki, Japan, assignor to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1984, Ser. No. 572,184
Claims priority, application Japan, Feb. 10, 1983, 58-19176[U]; May 31, 1983, 58-82646[U]; Jun. 9, 1983, 58-88697[U]; Jun. 9, 1983, 58-88698[U]
Int. Cl.[4] B43L *19/00*
U.S. Cl. 15—424 15 Claims



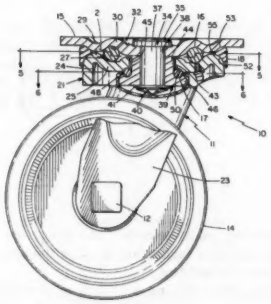
1. A device for collecting magnetic eraser dust comprising a permanent magnet for attracting magnetic eraser dust, a shield normally enclosing the permanent magnet to prevent direct adhesion of the eraser dust thereto and including a dust collecting wall having a thickness allowing the permanent magnet to attract the eraser dust therethrough, the permanent magnet being movable relative to the shield between a working position for attracting the eraser dust through the dust collecting wall of the shield, with the consequent adhesion of the eraser dust to the dust collecting wall of the shield, and a retracted position away from the dust collecting wall for releasing the collected eraser dust therefrom, and an eraser of a rubber composition having magnetic particles uniformly dispersed therein, the eraser being attached to the permanent magnet so as to at least partly project outwardly from the shield.

4,554,704

CORROSION RESISTANT CASTER

Lidio P. Raffaeli, Stratford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Dec. 14, 1983, Ser. No. 560,910
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—21 10 Claims



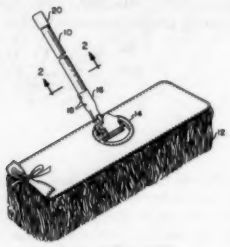
1. A caster assembly specially designed for use in a corrosive environment, comprising: a metallic horn member having an upper generally horizontal supporting portion and a downwardly extending wheel support portion, a wheel rotatably mounted in the wheel support portion of the metallic horn member, a metallic swivel plate pivotally mounted on the horn member horizontal supporting portion, the horizontal supporting portion of the horn member and the swivel plate having cooperating semi-torroidal annular bearing receiving surfaces each being coated with a permanently bonded high lubricity plastic polymer, and a pure torroidal bearing ring having a constant circular cross-section and constructed of a self-lubricating plastic polymer mounted between and engaging the bearing receiving surfaces on the horn member and the swivel plate.

4,554,705

ENCAPSULATED FIBERGLASS MOP HANDLE

John H. Murray, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 20, 1984, Ser. No. 642,557
Int. Cl.[4] B25G *1/10*
U.S. Cl. 16—110 R **2 Claims**



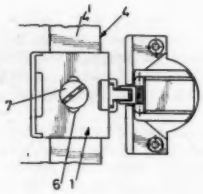
1. A handle for a piece of equipment comprising: a core member, a plurality of fiberglass strands surrounding said core and extending longitudinally thereof and a PVC tube heat shrunk around and contiguous with said fiberglass strands.

4,554,706

MOUNTING PLATE OF A HINGE FOR MOUNTING A DOOR ON FURNITURE FRAMES OF VARYING THICKNESS

Erich Röck, Höchst, and Helmut Rupprechter, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jun. 28, 1983, Ser. No. 509,231
Claims priority, application Austria, Jul. 8, 1982, 2666/82; Apr. 7, 1983, 1224/83
Int. Cl.[4] E05D *7/04*
U.S. Cl. 16—237 **10 Claims**



1. A mounting plate assembly of a hinge for mounting on a frame of an article of furniture a door of the article of furniture, said assembly comprising:

a mounting plate having a U-shaped configuration defined by parallel first and second side flanges and a center flange connecting said side flanges, said first side flange having means for supporting a hinge arm;

a two-part base plate positioned between said flanges within the U of said mounting plate for supporting said mounting plate on a furniture frame, said base plate including a centering member to be fixed to the frame and a sliding member mounted for longitudinal movement with respect to said centering member in direction parallel to said flanges, means for mounting said mounting plate on said sliding member for movement therewith in said directions, and said centering and sliding members having interengaging means for locking said sliding member with respect to said centering member, said interengaging means capable of being overcome by hand applied pressure to permit said movement; and

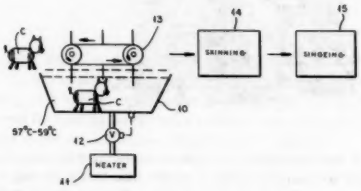
a fastening screw extending through said center flange of said mounting plate and through said centering member for fixing said centering member to the frame and for selectively fixing said mounting plate and thereby said sliding member to said centering member, said movement being permitted upon loosening of said fastening screw.

4,554,707

METHOD OF TREATING PIGSKIN

Fritz Simon; Klaus Körber; Horst Bandelow, all of Berlin; Michael Scherer, Hilbersdorf; Dieter Wilke, Berlin; Werner Thron, Berlin, and Gerhard Preuk, Berlin, all of German Democratic Rep., assignors to VE Fleischkombinat Berlin, Berlin, German Democratic Rep.

Filed Jul. 18, 1984, Ser. No. 631,918
Int. Cl.[4] A22B *5/08*
U.S. Cl. 17—47 **5 Claims**



1. A method of producing pigskin, the method comprising the steps of sequentially:

scalding the unprocessed pig carcass in a liquid bath at a temperature of substantially 57° to 59° C. for about 5.5 minutes;

removing the carcass from the bath after scalding for 5.5 minutes therein;

stripping the hide off the carcass; and

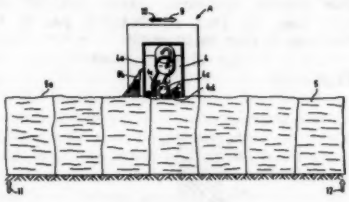
singeing the hide.

4,554,708

METHOD AND APPARATUS FOR SPRAYING TEXTILE FIBER BALES

Ferdinand Leifeld, Kempen; Rolf Coenen, Gronau-Epe; Werner Oelering, Gronau-Epe, and Ludwig Klopp, Gronau-Epe, all of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Aug. 16, 1984, Ser. No. 641,258
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330737
Int. Cl.[4] D01C *7/06*; D01B *3/04*
U.S. Cl. 19—80 R **10 Claims**



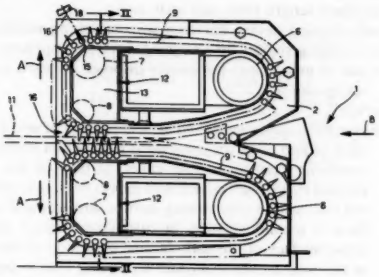
3. In a bale opener, having a horizontally back-and-forth travelling assembly, including an opening device for progressively removing fiber material from a top surface of the bale during a working pass; the improvement comprising the combination of said bale opener with a spraying means, including a spraying nozzle mounted on said assembly for travel therewith as a unit; said spraying nozzle being oriented downwardly for discharging a downwardly directed fluid on the top surface of the bale during travel of the assembly.

4,554,709

CHAIN-DRIVEN COMB HEAD FOR SLIVERS OF TEXTILE FIBRES, PARTICULARLY FOR DRAWING FRAMES

Angelo Bianchi, Novara, Italy, assignor to Sant-Andrea Novara Officine Meccaniche e Fonderie S.p.A., Italy

Filed Jul. 13, 1984, Ser. No. 630,553
Int. Cl.[4] D01G *19/22*
U.S. Cl. 19—218 **2 Claims**



1. A chain-driven comb head for slivers of textile fibres, particularly for drawing frames, of the type comprising a fixed structure, two series of combs formed by needle-carrying bars and defining two needle fields which intersect in a zone of treatment of the sliver, chains for driving said combs about two superimposed closed paths, and means for directing compressed air jets at said combs, wherein the improvements consist in:

said means for directing compressed air jets against the combs including means for supplying compressed air to each needle field and means for generating, from the compressed air fed into each needle field, at least one flat jet of compressed air directed outwardly in a predetermined direction which does not intersect said zone of treatment, whereby said flat jet flows successively over the surfaces of the combs of said needle fields during movement of said combs;

each said needle-carrying bar being rotatably mounted about its axis and having one end out of alignment, and

said fixed structure of the head including at least two shaped tracks engaged by said non-aligned ends of the needle-carrying bars, said tracks being shaped so as to cause said combs to orient themselves in a predetermined direction when they pass in front of said first jet.

4,554,710

TIE TACK

Charles R. Grant, 7337 Mission Gorge Rd., Santee, Calif. 92701

Filed Jun. 25, 1984, Ser. No. 624,183
Int. Cl.[4] A41D *25/04*
U.S. Cl. 24—49 CF **5 Claims**

1. A tie tack device for holding a tie in position on the wearer thereof, said tie having front and back portions when worn comprising:

a loop attached to said front portion, said back portion is insertable therethrough for maintaining the two portions in substantial alignment;

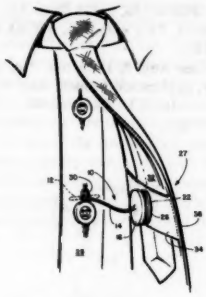
a button hole engagement cross-bar shirt attachment means;

a first releasable fastening means;

a flexible member extending between the cross-bar and first fastening means; and

a second releasable fastening means fixedly attached to the rear surface of said loop adjacent the wearer and for mating with said first releasable fastening means;

said first and second releasable fastening means comprising fastening elements of the hook and loop type characterized by the property that when placing a surface containing hooks into face-to-face contact with the surface containing loops, a plurality of hooks engage a plurality of



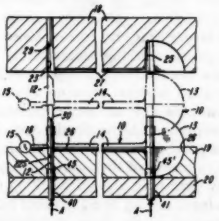
loops which resist separation parallel to the inter facial plane of engagement but are readily separable by peeling forces applied substantially normal to the plane.

4,554,711

FASTENER ASSEMBLY AND MOLD FOR MAKING SAME

Gene R. Derringer, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sep. 25, 1984, Ser. No. 654,345
Int. Cl.[4] B29C *17/02*; B65D *85/24*
U.S. Cl. 24—150 FP **12 Claims**



1. A one-piece fastener adapted to be molded in a mold with moldable plastics material and having a bar section and a button section joined by a filament section, wherein the bar section has terminal ends and the filament section is joined to the bar section at a location of joinder between the terminal ends, wherein the bar section has a first portion between one terminal end and the location of joinder and a second portion between the other terminal end and the location of joinder, wherein the first portion has a side surface, and means on the side surface of the first portion cooperable with a surface of the mold for providing the first portion with a greater resistance to release from the mold than the resistance to release from the mold of the second portion.

4,554,712

SAFETY HOOKS

Roger M. Le Beon, 7, Bd Louis Nail BP 138, 56103 Lorient Cedex, France

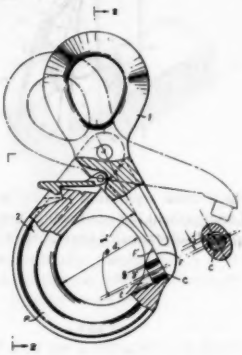
PCT No. PCT/FR83/00166, § 371 Date Apr. 4, 1984, § 102(e) Date Apr. 4, 1984, PCT Pub. No. WO84/00744, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 8, 1983, Ser. No. 604,647

Claims priority, application France, Aug. 6, 1982, 82 14027

Int. Cl.[4] A44B *13/00*

U.S. Cl. 24—241 PP **8 Claims**



1. A safety hook having a hook body (**2**) with an articulated arm (**1**) on said hook body top part, and opening externally from the hook and also having a fastening device of the free end of the hook body where it forms a free end of the arm, said fastening device having a flat contact face (f, f') on each part of the arm and body, one of the flat faces having a cylinder-shaped prominence (c) the axis of which is perpendicular thereto; and the other of the faces having a cylinder-shaped hole (t) the axis of which is perpendicular thereto and the dimensions of which are greater than those of the prominence and situated such as to accept the prominence into it when the hook is shut, thus constituting a fastening device of the body of the hook by the arm and preventing the body from any premature bending of the hook by the arm and preventing the body from any premature bending out of shape; and said fastening device further comprising for operation when the hook is not loaded, a loose setting (j) of the fastening device between contact generating parts (g) and (g') of the prominence and of the hold and larger than the normal loose setting required for a good mechanical working of the safety hook and allowing the body of the hook to support by itself the load for which it has been designed without creating any contact between the prominence and the hole of the fastening device; or allowing the arm to support the overloads due to the coming into contact of the prominence and the hold after elimination of the loose setting by means of the elastic flexing of the body of the hook, thereby obtaining a good working of the fastening device with the loose setting being situated between 0.02 and 0.04 times the diameter of the circle inscribable (d) in the interior space defined by the arm and the body of the hook.

4,554,713

APPARATUS FOR DIFFERENTIALLY STRETCHING, ALIGNING AND CUTTING SHEET MATERIAL

Joseph Chabal, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 7, 1982, Ser. No. 415,638

Int. Cl.[4] B29C *17/02*; B29D *7/24*

U.S. Cl. 26—51 **7 Claims**

1. Apparatus for stretching, aligning and cutting a continuous web of arcuately shaped, flexible material comprising:

a differential web stretching station having first drive means to move said web at a continuous first speed along a curved path;

a cutting station positioned along said curved path, spaced from said stretching station, said cutting station having a web cutting means;

second drive means;

timer means acting on said second drive means to intermittently drive a given length of web through said cutting station at a second speed greater than said first speed and acting on said web cutting means to cut a piece of a predetermined length from said web; and

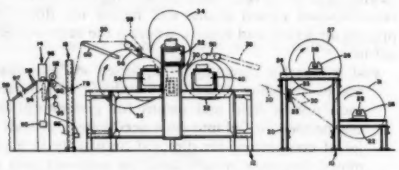
a web aligning device between said stretching station and said cutting station, said aligning device comprising:

a pair of guide posts oppositely disposed on each side of said path;

a rod;

means for slidably mounting an end portion of said rod in each of said posts for movement from a first position in overlying relation to the upper surface of the path defined by the web as said web moves from said stretching station into said cutting station, towards and away from a second position in overlying relation to the upper surface of the path defined by a loop of the web as the web moves from said stretching station toward but not into said cutting station;

stop means mounted at a first level in the path of a first end portion of said rod as the first rod end portion moves from the first position to the second position; and



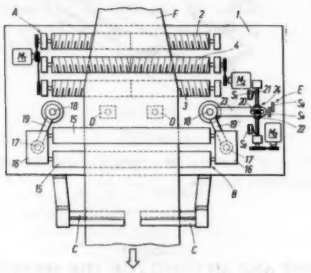
switch means operatively connected to said second drive means and said timer means and mounted at a second level vertically lower than said first level, in the path of a second portion of said rod as the second rod end portion moves from the first position to the second position;

wherein the length of the loop increases to move said rod from the first position towards the second position when said second drive means is inactivated by said timer means, to move said first rod end portion into engagement with said stop means, to pivot said second rod end portion about said stop means into engagement with said switch means to activate said second drive means, to activate said timer means as said second drive means is activated, to move the web into the cutting station at said second speed to decrease the length of the loop, to pivot the second rod end portion about said stop means away from said switch means, to continue to move the rod toward the first rod postion and thereafter move the first rod end portion away from the stop means as the rod continues to move toward the first rod position wherein the web, as in the loop decreases, engages the second rod end portion, the rod portion between the first and second rod portions and thereafter the first rod end portion to provide tension on the web and to maintain web alignment as said second drive means moves a predetermined length of web into said cutting station after which said timer means inactivates said second drive means and activates cutting means to cut a piece of web having a predetermined length.

4,554,714
MOVING WEB EXPANDING AND GUIDING APPARATUS

Hideyuki Cho, c/o Toyo Machinery Co. Ltd., 4-4-19 Zuiko, Higashiyodogawa-ku, Osaka-shi, Japan

Filed Mar. 7, 1984, Ser. No. 586,990
Claims priority, application Japan, Mar. 11, 1983, 58-41090
Int. Cl.[4] D06C *3/06*
U.S. Cl. 26—75 **3 Claims**



1. A moving web expanding and guiding apparatus comprising:

an expander device including:

(a) two expanding screw rolls over which the moving web travels,

(b) a first motor means for positively rotating said two screw rolls in the same direction,

(c) a third expanding screw roll interposed between said two screw rolls,

(d) means for adjusting the amount of the push-in of said third expanding screw roll relative to the moving web, and

(e) a further motor means for positively rotating said third screw roll in a direction opposite to that of said two screw rolls;

a guide device including:

(a) tiltable centering rolls rotatably installed at a web delivery side of said expander device,

(b) a tilting means for tilting said centering rolls, and

(c) moving web selvage detector means for detecting deviations of the moving web and for actuating said tilting means to correct this deviation;

emergency screw roll stop means for quickly stopping the rotation of said screw rolls when the moving web excessively zigzag deviates; and

centering roll time-delay stop means for stopping the operation of said centering roll tilting means after the centering rolls are restored to a neutral position subsequent to the stoppage of said screw rolls.

4,554,715
METHOD FOR THE FINISHING OF TEXTILE SHEETS

Ingeborg Reim, Cottbus; Gerhard Pohl, Forst; Wolfgang Götzke, Forst; Dieter Wahnberger, Forst; Lothar Postel, Forst; Irmgard Kindlein, Forst; Rudolf Vatter, and Manfred Greschke, both of Cottbus, all of German Democratic Rep., assignors to VEB Forster Tuchfabriken, Forst, German Democratic Rep.

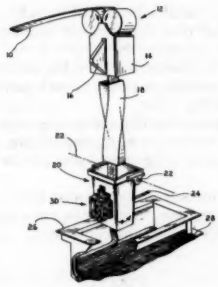
Filed Feb. 24, 1984, Ser. No. 582,981
Int. Cl.[4] B32B *5/06*
U.S. Cl. 28—107 **3 Claims**

1. Method of producing a fabric comprising feeding to a multiple needling device having closed barbed felting needles the following two materials (a) and (b), (a) a textile web comprising a fabric or array of warp yarns constituted of at least one of rotor-spun yarns, Murata jet-spun yarns, friction-spun yarns, and sirospun yarns and (b) overlying at least a portion of a surface of the textile web a textile of fiber material comprising at least one of a fleece, effect fibers, effect fiber bundles, an array of disordered fibers, a textile sheet, imitation fur and fabric lining material, needling the resultant superimposed layers (a) and (b) from the side of the textile or fiber material (a) by means of the multiple needling device, the needling comprising projecting the needles first into the textile or fiber material (a) so that portions of the fibers thereof are engaged by the needles, then projecting the needles into and through the textile or fiber material (b) so that some fibers from the textile or fiber material (b) are carried together with fibers of the textile web (a) onto the surface of the textile web (a) thereby connecting together the textile web (a) and the textile or fiber material (b) and forming a surface overlying the textile web (a) and constituted of a mixture of fibers and yarns of textile web (a) and textile or fiber material (b).

4,554,716
APPARATUS FOR TENSIONING AND FORWARDING TOW

Gary F. Nunn, Summerville, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 21, 1984, Ser. No. 591,847
Int. Cl.[4] D02G *1/12, 1/20*
U.S. Cl. 28—263 **3 Claims**

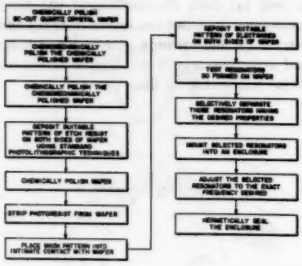


1. In a tow processing apparatus including a stuffing box crimper having crimper rolls to feed tow to the crimper, a J-box operably arranged to receive tow moving in a path from the crimper through an associated piddler spout adapted to oscillate parallel to the nip of the crimper rolls to lay the tow in folds in the J-box and a moving conveyor belt arranged to carry the folded tow from the J-box during normal operation, the improvement in apparatus for tensioning and forwarding the tow as it passes from the crimper through the spout during startup comprising: a jet having separable jet halves located on each side of said path in said spout, each jet half being mounted to said spout for movement by a linkage toward said path to be joined together during startup and away from said path to be separated during normal operation; means connected to each said linkage for movement thereof; means to supply pressurized fluid to each of said jet halves when they are joined together and to discontinue to supply pressurized fluid when they are apart; and control means for actuating the movement of said jet halves and for controlling the supply of pressurized fluid.

4,554,717
METHOD OF MAKING MINIATURE HIGH FREQUENCY SC-CUT QUARTZ CRYSTAL RESONATORS

John R. Vig, Colts Neck, and Arthur Ballato, Long Branch, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,546
Int. Cl.[4] H04R *17/00*
U.S. Cl. 29—25.35 **4 Claims**



1. Method of making miniature high frequency SC-cut quartz crystal resonators that are free of etch channels and etch pits and that exhibit high Q and that are free of process and material defect induced nonlinearities from a plano-plano SC-cut quartz crystal wafer, said method including in the following order the steps of:

(A) chemically polishing the wafer

(B) chemomechanically polishing the chemically polished wafer

(C) chemically polishing the chemomechanically polished wafer

(D) depositing a suitable pattern of an etch resist of the wafer using standard photolithographic techniques

(E) chemically polishing the wafer

(F) stripping the photoresist from the wafer

(G) placing a suitable evaporation mask pattern into intimate contact with the wafer

(H) depositing metallic film electrodes onto the wafer

(I) testing the resonators so formed on the wafer

(J) selectively separating those resonators having the desired properties,

(K) mounting the selected resonators into an enclosure,

(L) adjusting the frequencies of the resonators, and

(M) hermetically sealing the enclosure.

4,554,718
METHOD OF REINFORCING A CEILING RUNNER

James C. Ollinger, and Melvin H. Shaub, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jun. 4, 1984, Ser. No. 616,499
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—155 R **2 Claims**

1. The method of making a ceiling runner comprising the steps of:

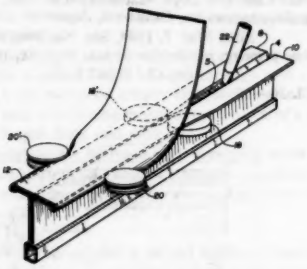
(a) forming an inverted T-shaped runner from one piece of metal with the metal folded in half to form two parts of a vertical web and two horizontal flanges at the base of the web with one horizontal flange disposed perpendicularly on each side of the vertical web,

(b) applying a strip of metal to the underside of both horizontal flanges with the sides of the strip of metal extending beyond the edges of the horizontal flanges,

(c) wrapping each side of the strip of metal around and slightly over each edge of the horizontal flanges whereby the bottom and edges of the horizontal flanges are encased in the strip of metal, and

(d) the improvement comprising the step of:

(1) applying an adhesive material to the interface of the two parts of the vertical web just prior to the time the two parts are placed in contact and held in position by

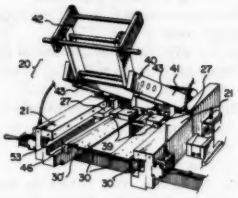


the strip of metal wrapped around the edges of the horizontal flanges.

4,554,719
MACHINE AND METHOD FOR THE MANUFACTURE OF AN AIR-TO-AIR HEAT EXCHANGER

James H. Lewis, London, Canada, assignor to Nutech Energy Systems, Inc., Exeter, Canada

Filed Apr. 1, 1983, Ser. No. 481,244
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—157.3 R **8 Claims**



1. In a method for forming a heat exchange core from thin metallic sheets having edge flanges projecting peripherally therefrom, a procedure for joining a pair of such sheets together in spaced apart, parallel, aligned orientation by forming joints from flanges of said pair of sheets along a pair of opposite edges thereof, said procedure comprising

(a) clamping each pair of sheet edges to be joined against top and bottom surfaces of a mandrel located between said edges with the flanges projecting in spaced, parallel planes beyond an edge surface of the mandrel into a work area; and

(b) moving a series of tool surfaces along each said work area in the longitudinal direction of said sheet edges;

(c) the leading tool surfaces acting to bend a first flange so that an inner portion thereof is bent to lie at right angles to the sheets against the edge surface of the mandrel and an outer portion thereof lies parallel to and against an inner portion of the second flange;

(d) the subsequent tool surfaces acting to bend an outer portion of the second flange around the end of the outer portion of the first flange to lie against such outer portion of the first flange and hence form an assembly in which said outer portion of the first flange is sandwiched between the two portions of the second flange;

(e) the final tool surfaces acting to bend such assembly to lie against the inner portion of the first flange and thus complete a substantially air tight joint that is mechanically interlocked against relative movement of the sheets in

both directions transverse to the direction of extent of such joint; and

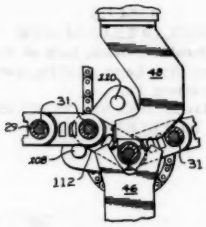
(f) withdrawing from the mandrel the pair of sheets thus joined together along a pair of opposite edges.

4,554,720

APPARATUS AND METHOD FOR TURNING A TRACK BUSHING

James A. Garman, Eureka, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 13, 1984, Ser. No. 640,056
Int. Cl.[4] B25B *13/48;* **B23P** *7/00*
U.S. Cl. 29—402.01 **22 Claims**



21. A method of turning a bushing of a track chain link assembly, said bushing having a set of links press fittedly connected to its opposite ends, comprising the steps of:

clamping said bushing with clamping means capable of exerting a predetermined clamping force on said bushing, said clamping means having at least one deformable insert engageable against said bushing, said insert being of a sufficiently soft material to conform to and have intimate clamping contact with the bushing upon and under application of said clamping force; and

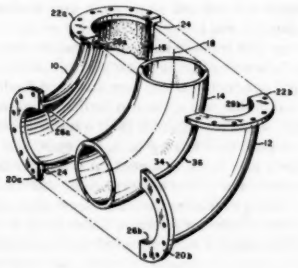
rotating said set of links a predetermined angular distance relative to said bushing.

4,554,721

METHOD OF MANUFACTURING A WEAR RESISTANT PIPE

Michael W. Carty, Narragansett, R.I., and Guenther M. Kraus, Windsor, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 26, 1983, Ser. No. 535,516
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—416 **2 Claims**



1. A method of manufacturing a wear-resistant non-linear tubular pipe segment, comprising the steps of:

fabricating an outer metallic support shell in the shape of a non-linear tubular pipe segment;

fabricating an inner, wear-resistant ceramic non-linear tubular liner in one piece for inclusion wholly within the outer shell;

splitting the outer shell longitudinally into a first half and a second half;

coating the interior of each shell half with a moldable bedding material;

placing the wear-resistant, one piece liner between the coated halves of the outer shell and embedding the liner in the moldable coating therewithin; and

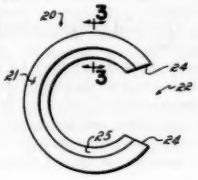
clamping and securing the halves of the outer shell together about the liner.

4,554,722

METHOD FOR REMOVING GUN BARREL EVACUATOR

Tommy J. Derrington, Denton, Tex., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Feb. 3, 1983, Ser. No. 463,643
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—426.5 **1 Claim**



1. The method of removing an evacuator from a gun barrel comprising the steps of,

transversely snapping a resilient plastic ring, having approximately a 90° sector removed, on said gun barrel adjacent the breech side of said evacuator, said ring having an annular recess and said evacuator having an annular projection mounted on the breech side thereof, sliding said ring snugly against said evacuator so that said recess mates with said projection,

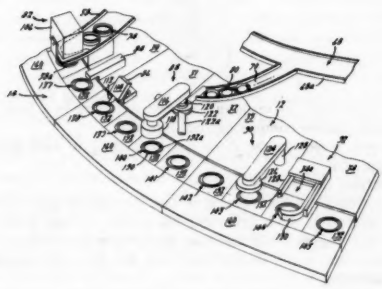
and striking said ring with axial blows to cause said evacuator to slide off said gun barrel.

4,554,723

TRANSFER APPARATUS AND METHOD

James A. Repella, Berkley, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Jul. 26, 1984, Ser. No. 634,825
Int. Cl.[4] B21D *39/03;* **B23P** *21/00;* **B23Q** *15/00;* **B65G** *43/10*
U.S. Cl. 29—430 **27 Claims**



1. A method of advancing a workpiece through a series of successive work stations for successive work operations by

work devices positioned at the work stations, said method comprising the steps of:

A. defining a series of successive work stations on a first carrier member;

B. mounting work devices, in series, on said first carrier member at at least some of said work stations;

C. moving said first carrier member at a given rate of speed in a given direction along a predetermined path;

D. placing the workpiece on a second carrier member;

E. moving said second carrier member at said given rate of speed and in said given direction along a path generally parallelling said predetermined path; and

F. selectively varying the relative speeds of said carrier members to advance the workpiece successively through said work stations for successive work operations by work devices positioned at said work stations.

10. An apparatus for advancing a workpiece through a series of successive work stations for successive work operations by work devices positioned at the work stations, said apparatus comprising:

A. a first carrier member mounted for movement along a predetermined path;

B. means defining a series of successive work stations on said first carrier member;

C. a series of work devices mounted on said first carrier member at at least some of said work stations;

D. a second carrier member mounted for movement along a path generally paralleling said predetermined path;

E. a series of workpiece holder devices mounted on said second carrier member at spaced locations therealong; and

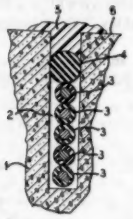
F. control means operative to drive said carrier members in a given direction along said paths and to selectively vary the relative speeds of said carrier members to selectively advance each of said workpiece holder devices successively through said work stations.

4,554,724

METHOD FOR INSTALLING AN AUTOMATIC GUIDED VEHICLE SYSTEM GUIDE PATH

Wesley R. Bantz, Peoria, Ill., assignor to AGVS Installations, Inc., Peoria, Ill.

Filed Jul. 31, 1984, Ser. No. 636,330
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—451 **8 Claims**



1. A method for installing at least one wire in a floor in a selected pattern comprising the steps of:

cutting a slot in the floor corresponding to said selected pattern;

inserting the wire in said slot;

inserting a mechanical seal in said slot above said wire initially so as to be flush with the surface of said floor;

further inserting said mechanical seal in said slot to a predetermined depth which is uniform for the entire length of said slot;

filling a remainder of said slot above said mechanical seal with thermoplastic material;

smoothing said thermoplastic material flush with said surface of said floor after curing of said thermoplastic material,

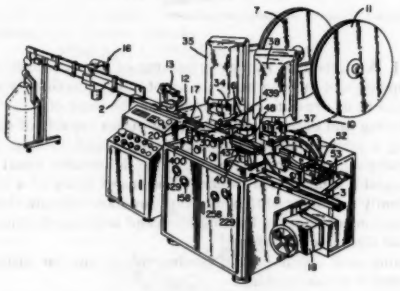
whereby said wire is retained in said slot permitting substantially unimpaired flexing thereof and with substantially no transmission of forces acting on said floor to said wire.

4,554,725

MODULAR LEAD MAKER

William R. Over; Donald A. Wion, both of Harrisburg, and Richard M. Heffner, West Lawn, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 25, 1983, Ser. No. 497,930
Int. Cl.[4] B23P *23/00*
U.S. Cl. 29—564.4 **7 Claims**



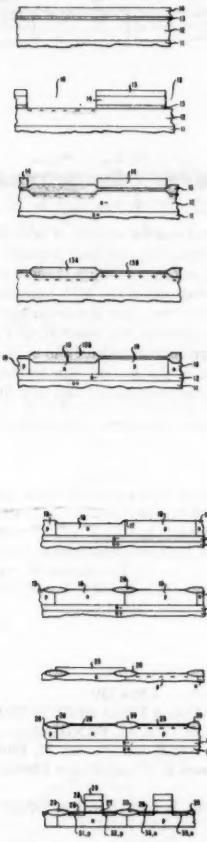
1. Lead making apparatus of the type comprising a pair of normally aligned conductor transfer heads, conductor cutting and stripping means comprising closable blades positioned between said transfer heads, conductor feed means for feeding a predetermined length of wire through said transfer heads and between said blades, a pair of conductor terminating stations remote from said cutting and stripping means, means for rotating the transfer heads from their normally aligned positions to positions adjacent respective terminating stations, a slide member on each of said transfer heads, each said slide member being movable toward and away from said blades when said heads are aligned, and toward and away from said terminating stations when said transfer heads are adjacent the terminating stations, and clamping means on each of said slide members for clamping fed conductor at the conclusion of feeding thereof, characterized in that said apparatus further comprises a pair of arcuate track segments adjacent each transfer head, said track segments of each pair having adjacent ends, said track segments of each pair being mounted on means to be pivotable about a common axis at said adjacent ends, said track segments of each pair being pivotable from a skewed position to a juxtaposed position where they form a continuous arcuate track, each said slide member carrying a follower which rides in the adjacent pair of track segments, whereby pivoting of said track segments effects movement of said slide member toward and away from said blades and toward and away from said terminating stations, rotation of the heads causing movement of the followers through the track segments, movement of a follower between track segments of a pair being effected when the track segments are juxtaposed.

4,554,726

CMOS INTEGRATED CIRCUIT TECHNOLOGY UTILIZING DUAL IMPLANTATION OF SLOW AND FAST DIFFUSING DONOR IONS TO FORM THE N-WELL

Steven J. Hillenius, Bethlehem, Pa., and Louis C. Parrillo, Warren, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 17, 1984, Ser. No. 601,353
Int. Cl.[4] H01L *21/22, 21/265*
U.S. Cl. 29—571 **9 Claims**



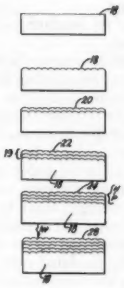
1. A process forming a CMOS integrated circuit comprising
preparing a silicon wafer which includes a surface layer of relatively high resistivity,
providing a first mask over the surface of said wafer for masking regions where p-tubs are to be formed, leaving exposed regions where n-tubs are to be formed,
implanting said exposed regions with fast and slow diffusing donor ions,
replacing the first mask with a complementary second mask for masking those regions where n-tubs are to be formed,
implanting the exposed regions with acceptor ions,
heating the wafer for driving the implanted ions deeper into the wafer forming contiguous n-tubs and p-tubs over the surface of the wafer,
while maintaining the complementary second mask, shallowly implanting additional acceptor ions into the p-tubs,
removing the complementary second mask,
forming a patterned field oxide over the surface of the wafer, leaving exposed the regions where transistors are to be formed without appreciable movement of the ions previously implanted, and
forming transistors in the exposed regions.

4,554,727

METHOD FOR MAKING OPTICALLY ENHANCED THIN FILM PHOTOVOLTAIC DEVICE USING LITHOGRAPHY DEFINED RANDOM SURFACES

Harry W. Deckman, Clinton; Horst Witzke, Flemington; Christopher Wronski, Princeton, and Eli Yablonovitch, Scotch Plains, all of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 405,075, Aug. 4, 1982, abandoned. This application May 22, 1984, Ser. No. 612,669
Int. Cl.[4] H01L *31/18*
U.S. Cl. 29—572 **15 Claims**

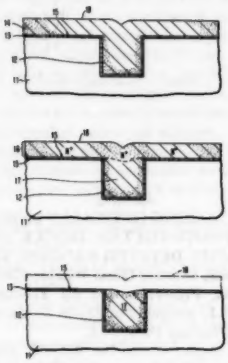


1. A method for producing an optically enhanced thin film photovoltaic semiconductor device having electrical contacts to carry current from said device comprising:
a. producing an active layer of semiconductor material wherein the surface of at least one side of said active layer is textured such that said surface includes randomly spaced, densely packed microstructures of predetermined dimensions of the order of the wavelength of visible light in said semiconductor material, said microstructure being microcolumnar posts having a predetermined profile such that said texture of said active layer results in optically enhancement by incoherent scattering with a randomization fraction, β, greater than 0.75;
b. forming a reflecting surface directly to either side of said semiconductor material and making an ohmic contact to said material such that the parasitic optical absorption in said electrical contacts and said reflecting surface are less than $1/n^2$, where n is the semiconductor index of refraction, such that the enhancement factor, E, for optical absorption within the active layer of the semiconductor material and the quantum efficiency of collection of photogenerated carriers in increased by a factor greater than 1.5 n^2.

4,554,728
SIMPLIFIED PLANARIZATION PROCESS FOR POLYSILICON FILLED TRENCHES

Joseph F. Shepard, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1984, Ser. No. 624,876
Int. Cl.[4] H01L *21/22, 21/302, 21/76*
U.S. Cl. 29—576 W **8 Claims**



1. A method of forming dielectric isolation in a semiconductor substrate comprising the steps of:

forming a pattern of trenches into one surface of said semiconductor substrate;

forming conformally an insulating layer on said substrate and in said trenches;

forming a single semiconductor layer over the insulating layer thereby filling the trenches and covering the upper surface of the insulated substrate until the top of said semiconductor layer is substantially planar;

introducing in a vertically downward direction an impurity into the semiconductor layer from the top surface of said semiconductor layer to the depth of the upper surface of the insulated substrate whereby the impurity concentration of the semiconductor layer found in the trenches is substantially lower than the impurity concentration of the semiconductor layer found above the level of and on the upper surface of the insulated substrate; and,

selectively removing the semiconductor layer found above the level of and on the upper surface of the insulated substrate by utilizing the difference in impurity concentrations,

whereby is obtained semiconductor-filled trenches having upper surfaces in substantial planarity with the substrate surface,

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4,554,729
METHOD OF MAKING SEMICONDUCTOR MEMORY DEVICE

Nobuyoshi Tanimura, Musashino, and Tokumasa Yasui, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

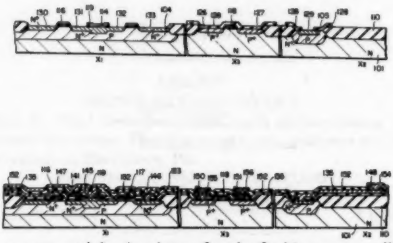
Filed Jan. 22, 1982, Ser. No. 341,623
Claims priority, application Japan, Feb. 6, 1981, 56-15733
Int. Cl.[4] H01L *21/28, 21/26*
U.S. Cl. 29—577 C **23 Claims**

1. A process for fabricating a semiconductor memory device having MIS transistors composing memory cells, the memory cells having load resistors, the load resistors being connected to a power supply line, and peripheral circuits having MIS transistors, with the gate of at least one of the MIS transistors of the peripheral circuit being connected with a protection resistor, comprising the steps of:

forming a first film of an electrically conductive material, which serves as the gate of the MIS transistors composing memory cells of the semiconductor memory device, over a semiconductor substrate, said first film having a first resistivity;

forming an insulation film to cover the semiconductor substrate which is formed with each of the MIS transistors composing said memory cells; and

forming second films, which second films include a layer of polycrystalline silicon, which second films respectively



serve as each load resistor of each of said memory cells, as a wiring for connecting the load resistors with a power supply line and as the protection resistor connected with the gate of at least one of the MIS transistors composing peripheral circuits, over said insulation film covering said semiconductor substrate, the resistivity of the second films serving as said protection resistor and as said wiring being lower than that of the second film serving as said load resistor and higher than that of said first film.

4,554,730
METHOD OF MAKING A VOID-FREE NON-CELLULOSE ELECTRICAL WINDING

Dean C. Westervelt, Acme, and Thomas M. Burke, Whitehall, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 9, 1984, Ser. No. 569,069
Int. Cl.[4] H01F *3/06*
U.S. Cl. 29—605 **17 Claims**

1. A method of constructing an electrical winding insulated with solid resinous insulation, comprising the steps of:

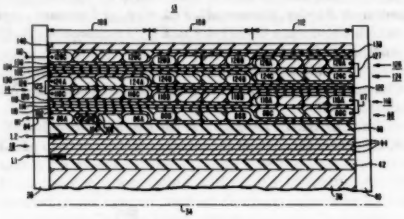
forming conductor turns on a first substrate,

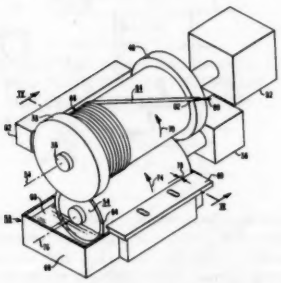
said forming step including the step of wet winding a conductor upon said first substrate,

said wet winding step substantially immersing each conductor turn in liquid resinous insulation, forming a liquid resinous interface between each conductor turn and said first substrate, to provide a void-free liquid intermediate insulative structure,

and building solid insulation, layer upon layer, on the conductor turns and first substrate from the liquid resinous insulation, during the step of forming conductor turns, said building step including the step of controlling the thickness of said layers of solid insulation to eliminate

shrinkage voids and preserve the void-free aspect of the liquid intermediate insulative structure, with said solid





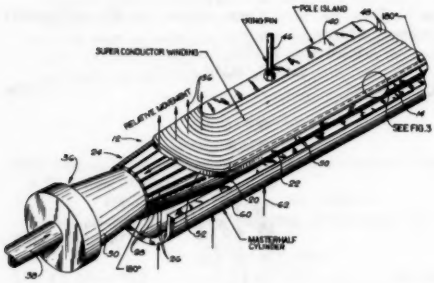
insulation, as it is formed, providing a second substrate upon which subsequent conductor turns may be formed.

4,554,731

METHOD AND APPARATUS FOR MAKING SUPERCONDUCTIVE MAGNET COILS

Albert R. Borden, El Cerrito, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 7, 1983, Ser. No. 549,379
Int. Cl.⁴ H01F 7/06
U.S. Cl. 29—605 **13 Claims**



1. A method of making a curved generally pancake-shaped coil adapted to be mounted around a 180-degree segment of a cylindrical support,

such method comprising the steps of providing a tubular mandrel having a tubular cylindrical substantially rigid mid-portion terminating at both ends in tapered tubular end portions formed with a multiplicity of longitudinal slots providing flexible fingers between said slots,

providing an elongated oval shaped pole island in engagement with the outside of said cylindrical mid-portion and parallel with the axis thereof,

winding an elongated electrical conductor around said pole island to form a multiplicity of generally oval shaped turns in engagement with a 180-degree segment of the outside of said mandrel,

said turns having longitudinal portions with curved portions extending therebetween,

the curved portions of at least some of said turns engaging said tapered end portions of said mandrel,

providing tapered expansion members of circular cross section for expanding said tapered end portions, and

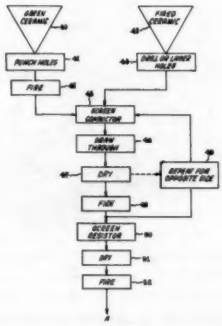
inserting said expansion members into said tapered end portions of said mandrel and thereby displacing said flexible fingers outwardly into a generally cylindrical form so as to displace said curved portions of said turns into a shape conforming to said cylindrical form while also exerting increased tension upon the turns of the coil to minimize draping of the longitudinal portions of said turns and to enhance the mechanical integrity of said coil.

4,554,732

HIGH RELIABILITY ELECTRICAL COMPONENTS

James L. Sadlo, Oakdale, and Gary D. Musil, Minneapolis, both of Minn., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 349,080, Feb. 16, 1982, Pat. No. 4,486,738.
This application Aug. 1, 1984, Ser. No. 617,056
Int. Cl.⁴ H01C 17/06
U.S. Cl. 29—620 **4 Claims**



1. A process for fabricating an array of electrically interconnected spaced electrical circuit components which are separated to form a plurality of individual discrete resistors comprising the steps of

forming a series of through apertures in a substrate of electrically insulating material and aligned in at least two parallel rows, both said rows and apertures in each row being spaced apart from each other,

depositing thick film paste electrical conductor material as a continuous strip on one surface of said substrate to form at least two parallel rows of spaced apart conductor portions surrounding each aperture and serving as terminal conductor pads for an individual resistor, applying a pressure differential across said substrate to draw said deposited conductor material along walls of said apertures to form connector portions extending toward the opposite surface of the substrate,

depositing further thick film paste electrical conductor material as a continuous strip on the opposite surface of said substrate to form at least two parallel rows of spaced apart conductor portions surrounding each aperture on said opposite substrate surface corresponding to said spaced conductor portions on said one substrate surface and also

serving as further terminal conductor pads for an individual resistor and then applying a pressure differential across said substrate to draw said further conductor material along walls of said apertures towards said one substrate surface to form connector strips electrically connecting corresponding conductor portions,

depositing thick film resistor material on one substrate surface to form a pattern of spaced bars between adjoining pairs of said spaced conductor portions aligned in a transverse row and electrically interconnected thereto, and

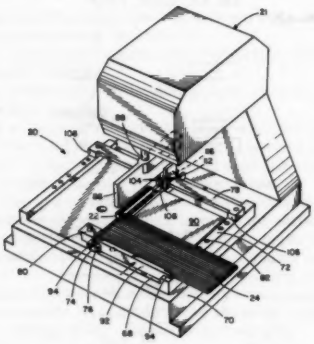
dicing said substrate by scribing a line between and parallel to said spaced resistor bars in one direction and bisecting said conductor portions in the other direction to provide said plurality of individual discrete resistors.

4,554,733

TERMINATION TOOLING FOR APPLYING CONNECTORS TO FLAT CABLE

Jack E. Caveney, Hinsdale, Ill., assignor to Panduit Corp., Tinley Park, Ill.

Filed Feb. 28, 1983, Ser. No. 470,850
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—749 **17 Claims**



1. Termination tooling adapted for use with a prime mover, such as a bench press, for terminating a flat cable in an elongate connector, said connector comprising an insulative base and an insulative cover having a plurality of spaced insulation displacement metallic terminal elements extending toward said cover and corresponding in number and position to the conductors of said flat cable, said tooling comprising:

a termination die for terminating said cable in said connector;

positioning means for holding a connector in place for termination by said die;

stop means disposed spaced from said termination die for engaging one end of said flat cable with the axial direction of said cable being generally normal to the longitudinal direction of said connector to locate said end with respect to said connector; and

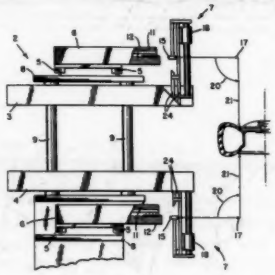
slide means for supporting said cable, said slide means being movable transversely of the axial direction of said cable between a loading position, wherein said cable engages said stop means, and a termination position, wherein said cable is positioned for termination in said connector by said die, whereby said cable is positioned with respect to said connector without said stop means engaging said cable during termination.

4,554,734

APPARATUS FOR AUTOMATIC INSERTION OF BALANCE WEIGHTS FOR USE IN AUTOMOBILE-WHEEL BALANCING EQUIPMENT

Rembrandt Sander, Darmstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed May 9, 1984, Ser. No. 608,620
Claims priority, application Fed. Rep. of Germany, May 9, 1983, 3316945
Int. Cl.[4] B23Q *7/10, 17/00;* **G01M** *1/16;* **B60B** *1/00*
U.S. Cl. 29—818 **6 Claims**



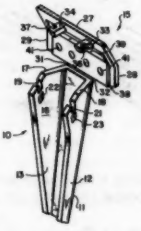
1. An apparatus for automatic insertion of balance weights onto an automobile wheel, said apparatus comprising: balance weight carrier means for receiving and carrying balance weights having through bores, delivery means for taking individual balance weights from the carrying means and applying the weights to the rim flange of the automobile wheels, said carrier means including upper and lower parts having compartments for receiving the balance weights and movable toward the delivery means by a relative movement of the lower part with respect to the upper part, said delivery means including mandrels receivable in the through bores of the balance weights for taking the balance weights out of the carrier means, and an insertion head carried by the delivery means, said insertion head being pivotable to accommodate minor inaccuracies of the automobile wheels when the balance weights are applied to the rim flange of the automobile wheels.

4,554,735

ONE-PIECE DISPOSABLE RAZOR

Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 4, 1984, Ser. No. 607,041
Int. Cl.[4] B26B *21/00*
U.S. Cl. 30—47 **1 Claim**



1. A disposable one-piece plastic razor comprising:

two basic plastic elements, one of said elements defining a handle, the other of said elements defining a cap, hinge means connecting both elements to facilitate relative rota-

tion of said elements from a first or open position to a second or closed position and latch means for retaining the elements in the closed position with a single blade having a single cutting edge fixed to the cap and sandwiched therebetween, said hinge means having an axis parallel to said cutting edge, said handle being formed with a pair of spaced support elements having coplanar surfaces for supporting the blade and fixing the degree of relative rotation of said elements, said latch means defining a pair of claws formed integrally with said cap and a mating pair of slots formed in said spaced support elements, said claws being operative to engage said slots in said closed position, said latch means further defining a pair of lugs depending from the cap cooperating with a pair of mating notches formed in the spaced support elements operative to align the cap and thus the blade edge relative to the handle and to fix and retain the desired degree of relative rotation between the cap and the handle.

4,554,736

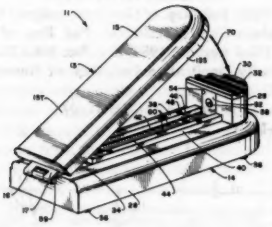
NUTCRACKER

David F. Rodriguez, 7537 Paddon Rd., Vacaville, Calif. 95688

Filed Dec. 3, 1982, Ser. No. 446,558

Int. Cl.⁴ A23N *5/00*; A47J *43/26*

U.S. Cl. 30—120.3 **10 Claims**



1. A nutcracker comprising in combination

a top part and a bottom part hingedly connected to each other at one end of each,

said bottom part comprising an elongated base having a top surface and a bottom surface,

an upstanding stop mounted on the top surface thereof at the appropriate end of said base from the hinge,

a pair of spaced parallel rails extending rearwardly from said stop toward said hinge, and a separate nut receiving plate disposed between said rails.

said top part including a weighted arm having an impact plate adapted to impact a nut placed between the spaced parallel rails of said bottom part.

4,554,737

NUTCRACKER

Willi Bartels, Horster Strasse 109, D-4505 Mönchen-Gladbach 2, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,313

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 8312209[U]

Int. Cl.⁴ A47J *43/26*

U.S. Cl. 30—120.3 **11 Claims**

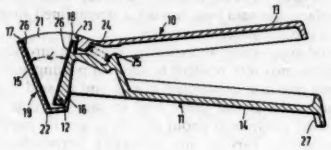
1. A nutcracker for cracking a nut and having an initial position, comprising:

two lever arms having first and second ends;

a hinge pin connecting said two lever arms to each other;

press jaws, each of which are disposed at said first ends of said two levers and have stop surfaces to limit the travel of said two lever arms, said press having an opening angle which is constant in the initial position of the nutcracker regardless of a nut size; and

a press cup forming said press jaws and having an open top and substantially plane press surfaces, said press cup forming a housing having side walls and a closed bottom, said



bottom and said side walls being made as one piece with one of said press jaws.

4,554,738

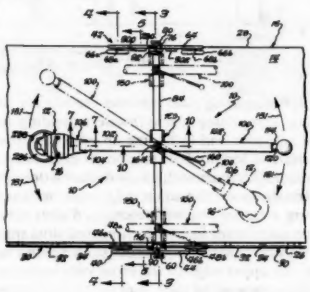
APPARATUS FOR SUPPORTING AND GUIDING MACHINE FOR OPERATING ON SHEET MATERIAL SUCH AS CLOTH

Robert C. Barrett, Angola; John H. Buscher, East Amherst, and William M. Putnam, Buffalo, all of N.Y., assignors to Eastman Machine Company, Buffalo, N.Y.

Filed Sep. 15, 1983, Ser. No. 532,288

Int. Cl.⁴ B26B *7/00*

U.S. Cl. 30—275 **37 Claims**



33. In apparatus comprising a machine for operating on sheet material such as cloth during movement of said machine over and along said material while said material lies on a supporting surface and means for supporting and guiding said machine during said movement over and along said supporting surface, said machine comprising a frame, a tool positioned for movement relative to said frame and to said material for operating thereon and motor means carried by said frame and drivingly connected to said tool for causing operating movement thereof, an improved supporting base for said machine for supporting said machine on said supporting surface during movement over and along said surface, said improved supporting base comprising:

(a) a sheet of resilient material having a leading edge portion adapted to contact said supporting surface and facing in the direction of travel of said machine, a trailing edge portion adapted to contact said supporting surface, and an intermediate portion between said leading and trailing edge portions shaped to be spaced from said surface;

(b) said intermediate portion being curved in a concave manner facing said supporting surface and having an opening to receive said tool for operating movement and having means for connecting said sheet to said frame;

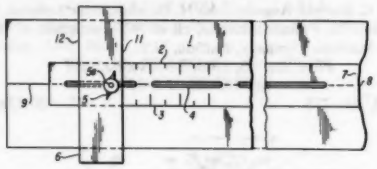
(c) said leading edge portion being shaped in a manner to facilitate movement along said supporting surface and under said material to guide said material over and along said sheet and said trailing edge portion being shaped in a manner such that the rearward edge thereof is spaced

from said surface to facilitate movement of said sheet over and along said surface; and

(d) said leading edge portions and said trailing edge portions providing the sole means of contact with said supporting surface and said base having a streamlined shape and size to reduce cutting resistance

(e) said supporting and guiding means comprising carriage means movable relative to said supporting surface and at least one arm connected at one end to said machine and connected at the other end to said carriage means for pivotal movement about an axis generally parallel to said supporting surface and generally perpendicular to the longitudinal axis of said at least one arm and for translatory movement across said supporting surface.

4,554,739
HEMMING RULE
Albert J. Kirsch, 5540 Wattsburg Rd., Erie, Pa. 16509
Filed Mar. 6, 1984, Ser. No. 586,700
Int. Cl.[4] A41H *1/00*
U.S. Cl. 33—2 H **1 Claim**



1. A rule for measuring pant legs and the like for shortening and hemming, comprising a lengthwise extending measuring stick having an upper end to be line up with the upper end of the inseam and two longitudinal side edges each provided with graduations in length units with graduations on one edge opposite like graduations on the other edge, said measuring stick further having a center line with elongated slots spaced from each other on said center line with elongated slots spaced from each other on said center line, a cross stick having upper and lower edges, the upper edge of the cross stick being nearer the upper end of the measuring stick, a pivot bearing between said upper and lower edges and offset to one side of the center line of the cross stick, a bolt extending through one of said slots and said pivot bearing, said cross stick by sliding of said bolt and pivoting of said cross stick on said bolt being adapted to be lined up with graduations on said lengthwise stick corresponding to the desired length, the lower edge of said cross stick when so lined up defining a cut line along which a cut should be made to remove surplus material and the upper edge of said cross stick defining a fold line along which material should be folded to produce the desired finished length.

4,554,740
PANTOGRAPHS
David Gill, 3200 25th St., Columbus, Ind. 47203
Filed Feb. 27, 1984, Ser. No. 583,748
Int. Cl.[4] B43L *13/10*
U.S. Cl. 33—25 R **15 Claims**

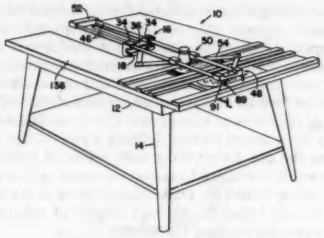
1. A pantograph apparatus comprising:

means for defining at least one elongated support guide;

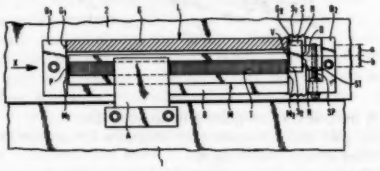
base means for at last pivotally supporting said support guide about a first axis perpendicular to a reference plane;

first and second elements supported by said support guide means on one side of said base means for linear displacement along the longitudinal axis of said support guide means relative to the first axis and for simultaneous rotational displacement in the same direction around said first axis;

means defining an interconnecting assembly for interconnecting said base means and said first and second elements to cause simultaneous linear displacements of said first and second elements in the same direction along said longitudinal axis toward and away from said first axis at a predetermined ratio whereby the two dimensional displacement of said first and second elements relative to said base means are a given ratio relative to one another in said reference plane.



4,554,741
MEASURING SYSTEM
Alfred Affa, Stein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany
Filed Apr. 10, 1984, Ser. No. 598,829
Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316082
Int. Cl.[4] G01B *11/04*
U.S. Cl. 33—125 C **12 Claims**



1. In a measuring system for measuring the relative position of first and second objects, of the type comprising a scale which is secured to the first object and which defines first and second ends, and a scanning unit which is secured to the second object to scan the scale, the improvement comprising:

an expansion element having a first end coupled to the first object and a second end, said expansion element having a coefficient of thermal expansion which differs from that of the first object;

means for coupling the second end of the expansion element to the second end of the scale such that the expansion element applies a force on the scale which varies as function of temperature to maintain the measuring length of the scale substantially constant over a range of temperatures.

4,554,742
DIMENSIONAL CHECKING TOOL
Otto W. Freitag, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sep. 16, 1983, Ser. No. 533,026
Int. Cl.[4] G01B *7/14*
U.S. Cl. 33—143 L **4 Claims**

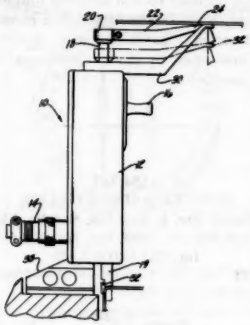
1. A dimension checking tool comprising:

An elongated handle;

a base portion positioned at one end of the handle, and including a curved outer surface;

a measuring rod slidably engaged within the elongated handle for longitudinal movement with respect to the elongated handle and extending from one end of the elongated handle;

a trigger mechanism directly coupled to the measuring rod and extending transversely outwardly from the elongated handle for permitting manual longitudinal positioning of the measuring rod;



caliper means comprising first finger means fixed for longitudinal movement with the measuring rod and second finger means nestably engageable with the first means and fixed to the one end of the elongated handle, both of said finger means being formed to extend longitudinally and transversely away from the elongated handle; and

wherein the measuring rod also extends from the other end of the elongated handle, terminating in a curved end portion adjacent the base portion.

4,554,743

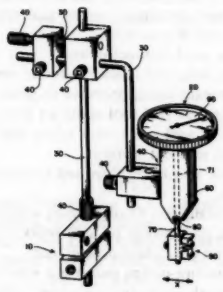
UNIVERSAL HEAD PROTRUSION GAUGE FOR VIDEO RECORDERS

Wayne B. Graham, San Jose, and John Bonn, Saratoga, both of Calif., assignors to Tentel Corporation, Calif.

Continuation-in-part of Ser. No. 480,515, Mar. 30, 1983, abandoned. This application Mar. 30, 1984, Ser. No. 595,139

Int. Cl.[4] G01B *3/22*

U.S. Cl. 33—172 R **13 Claims**



1. A gauge for measuring the protrusion of a head from a surface of a drum in a video recorder, comprising:

a dial indicator for indicating the amount of protrusion of said head;

a measuring stem cooperating with said dial indicator and rotatably mounted relative to the dial indicator on a first pivot;

a cap mounted rigidly to the measuring stem; and

a leveling block freely mounted relative to the cap on a second pivot, said leveling block having a substantially flat face adapted for engagement with the surface of said drum of the video recorder so that a dial indicator zero position can be determined, said leveling block comprising target zone means for ensuring that the head will contact the leveling block at a point within a known distance of the center of rotation of the second pivot to displace said leveling block at said point a distance equivalent to the protrusion of said head from said surface of said drum thereby rotating said measuring stem.

4,554,744

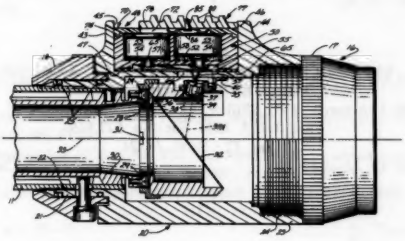
SWITCH ASSEMBLY FOR RIFLESCOPE

Claus O. Huckenbeck, Tehachapi, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,043

Int. Cl.[4] G02B *27/34*

U.S. Cl. 33—241 **13 Claims**



1. In a riflescope having an optical system for viewing a target image, and including a light source, and means for directing light from the source to provide an illuminated aiming point superimposed on the target image, the improvement comprising:

a compartment on the riflescope for supporting a battery to operate the light source;

a cover member fitted over the battery compartment, the cover member having an opening therethrough;

a switch member slidably and captively fitted on the cover member, and having an electrically conductive portion for completing a circuit between the battery and light source when the switch member is in a first position, and for disconnecting the circuit when the switch member is in a second position, the switch member being of resilient construction to be disengageable to enable tool-free removal of the switch and cover members for battery replacement, and the movable conductive portion bearing directly on the battery in the first position; and

the switch and cover members being configured to enclose the battery compartment when the switch member is in either the first or second position.

4,554,745

DEVICE FOR ALIGNING AN ADJUSTABLE SIGHT ELEMENT IN A SIGHT SYSTEM FOR RIFLES

Otto Repa, Oberndorf, Fed. Rep. of Germany, assignor to Carl Walther GmbH, Ulm, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,056

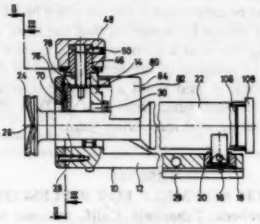
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308552; Jul. 26, 1983, 3326853

Int. Cl.[4] F41G *1/02*

U.S. Cl. 33—257 **16 Claims**

1. In a device for aligning an adjustable sight element in a sight system for rifles and the like, a housing having a vertical portion and adapted to be attached to a rifle, a vertically and horizontally adjustable sight element mounted on said housing,

a printed circuit board electrode on said housing vertical portion and a second electrode on said adjustable sight element to define means responsive to the movement of said adjustable sight element, and digital read-out means connected to said



movement responsive means for indicating visually the magnitudes of the horizontal adjustment and vertical adjustment of the adjustable sight element with respect to a predetermined zero setting.

4,554,746

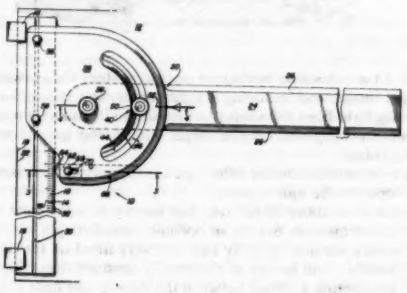
SELF-LOCKING-AND-MEASURING RULER FOR COMPUTER-PRINTOUT FORMS

Luis Echeverria, 1501 Silliker, La Habra, Calif. 90631

Filed Jul. 3, 1984, Ser. No. 627,869

Int. Cl.[4] B43L *13/24*

U.S. Cl. 33—447 **5 Claims**



1. A self-locking-and-measuring, straight-edge apparatus, comprising:

a scaled guide-bar member adapted to be fixedly secured to a substantially flat-surfaced structure;

a plurality of notches formed along at least one longitudinal edge of said scaled guide-bar member;

a scale having predetermined measures disposed on said scaled guide-bar member, whereby said notches are spaced apart with respect to said scale;

a groove formed longitudinally in said scaled guide-bar member and parallel with said notched edge thereof;

a base-plate member adapted to be slidably mounted to said scaled guide-bar member;

wherein said base-plate member includes means for adjusting the angular position of said straight edge with respect to said scaled guide-bar members;

guide means mounted to said base-plate member and adapted to be slidably received in said longitudinal groove for perpendicular movement along said scaled guide-bar member;

wherein said guide means comprises a pair of aligned guide pins mounted and located in said base plate member, whereby said guide pins are slidably received in said Longitudinal groove of said scaled guide-bar member;

latching means operably attached to said base-plate member for selective engagement with said notches;

wherein said latching means comprises:

a latching tongue adapted to engage selective notches along said edge of said scaled guide-bar member, said latching tongue being slidably attached to said base plate;

a spring positioned to engage said latching tongue in biased engagement with said notches; and

a release knob secured to said latching tongue; and

a straight edge secured to said base-plate member so as to be positioned normal to said scaled guide-bar member, whereby lines may be drawn horizontal to the scaled guide-bar member.

4,554,747

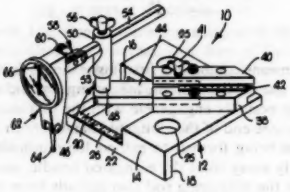
CONVEX RADIUS GAUGE

Robert G. Williams, Rte. 6, Box 206, Sedalia, Mo. 65301

Filed Feb. 19, 1985, Ser. No. 703,190

Int. Cl.[4] G01B *5/20*

U.S. Cl. 33—553 **14 Claims**



1. An apparatus for determining the radius of a convex surface on a workpiece, said convex surface being a junction between a pair of non-parallel, flat surfaces wherein said convex surface and said flat surfaces are perpendicular to a common plane, said apparatus comprising:

a support;

stop means connected to said support and engageable with said flat surfaces on said workpiece for aligning the latter relative to said support;

a member;

means shiftably mounting said member for selective movement along a line bisecting the angle between said flat surfaces of said workpiece when said stop means is engaged with said flat surfaces;

a tool having a work contactor; and

means coupling said tool to said shiftable member,

said coupling means being operable to pivotally move said work contactor of said tool about an axis parallel to said flat surfaces of said workpiece when said stop means is engaged with said flat surfaces,

said pivotal axis also being disposed to intersect with said bisecting line,

said coupling means also having means adjustably fixing the radius of the path swept by said work contactor as the latter is moved about said pivotal axis,

said tool also having means indicating whether the pivotal axis of the work contactor coincides with the center of curvature of said convex surface on said workpiece,

whereby said member can be shifted along said line and said work contactor can be moved radially of said pivotal axis until said pivotal axis and said center of curvature coincide,

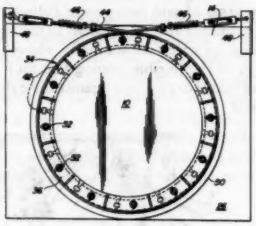
whereupon the radius of said convex surface can be determined by measuring the distance orthogonally from either of said flat surfaces on said workpiece to said pivotal axis.

4,554,748

MULTI-SEGMENT SEAL RING FOR ROTARY EQUIPMENT

Robert J. Nixon, Jr., 2112-22nd St., Rock Island, Ill. 61201

Filed Mar. 5, 1985, Ser. No. 708,628
Int. Cl.[4] F16J *15/24*
U.S. Cl. 34—242 **7 Claims**



1. Rotary equipment including a cylinder rotatable about a horizontal axis, an upright fixed wall having an opening through which the cylinder extends, said wall having an annular radial surface bordering the opening, a segmented seal ring encircling the cylinder and effecting a seal between the outer circumference of the cylinder and the wall surface, said ring including a plurality of arcuate segments radially disposed about the cylinder and respectively having inner axial sealing surfaces on a radius approximately equal to that of the cylinder, each segment having an inner flat radial surface seating against the wall surface and each pair of neighboring segments having circumferentially overlapping end portions forming a gap and radial interface between the neighboring segments, means for mounting the segments individually on the upright wall and permitting radial displacement of the segments relative to each other during rotation of the cylinder, means for tensioning the segments to hug the cylinder, and sealing means for sealing the gaps, characterized in that the overlapping end portions of each pair of neighboring segments are so configured that the gap has a relatively circumferentially wide mouth opening at the cylinder surface and converging to a relatively narrow channel intermediate the inner and outer circumferences of the ring, said channel extending to an outer open end at said outer circumference of the ring, and the sealing means at each gap includes a resilient element bridging the gap at the junction between the mouth and its channel, and said element is carried in part by one segment and in part by the neighboring segment.

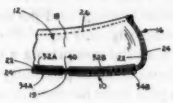
4,554,749

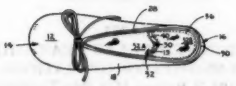
SLIPPER

Charles Ostrander, Middletown, N.J., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.

Continuation of Ser. No. 424,153, Sep. 27, 1982, abandoned. This application Sep. 21, 1984, Ser. No. 653,484
Int. Cl.[4] A43B *1/10*
U.S. Cl. 36—102 **8 Claims**

1. A flexible slipper comprising an upper defining a cover for encompassing the foot of a wearer, said cover including a unitary layer of elastic fabric defining a toe portion, a heel portion, a shank portion and a base portion, said shank portion interconnecting said toe and heel portions, said base portion interconnecting said toe, heel and shank portions and extending throughout the length of the slipper from the toe portion to the heel portion and beneath the foot of a wearer, and a sole comprising discrete fore and aft sections positioned in predetermined, spaced relation overlying sections of said base portion and means securing said fore and aft sections to said base portion.



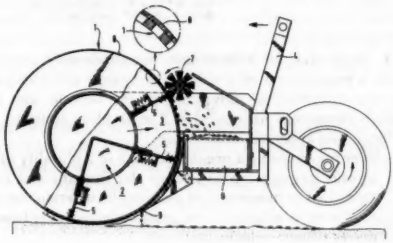


4,554,750

APPARATUS FOR COLLECTING PEAT FROM A PEAT FIELD

Hannu Jamsa, Eurajoki, Finland, assignor to Satoturve Oy, Eurajoki, Finland

Continuation of Ser. No. 488,143, Apr. 25, 1983, abandoned. This application Nov. 8, 1984, Ser. No. 669,732
Claims priority, application Finland, Jun. 1, 1982, 821929
Int. Cl.[4] E21C *49/00*
U.S. Cl. 37—3 **10 Claims**



1. A mobile vehicular-type apparatus for rolling over and collecting peat from a peat field comprising:

a body;

wheels or rollers supporting said body;

a power machine for propelling said apparatus over a peat field;

loosening means for loosening a peat layer from a peat field, said loosening means being rotatably journalled to said body and comprising at least one cylindrical drum having perforations and being adapted to exert the force of gravity as it rolls over the surface of a peat field, said drum carrying around its periphery a filter material which bridges said perforations;

said cylindrical drum having an internal negative pressure chamber formed by radially disposed, movable air tight partitions biased against the interior surface of said drum, said partitions being non-rotatable so that said filter material is sequentially brought into and out of communication with said negative pressure chamber, said negative pressure chamber being maintained in proximity to said peat layer as said drum rolls over the surface of the peat field, said filter material being a fibrous fabric which prevents the suction of peat particles and dust into said negative pressure chamber;

means for establishing a vacuum within said negative pressure chamber, said negative pressure chamber being effective to loosen from the field and fasten a layer of peat to the surface of said filter material by suction exerted on said filter material through said perforations;

means for removing said layer of peat from the surface of said filter material comprising a brush;

a cutter blade mounted in proximity to said filter material for shearing a peat layer fastened to said filter material into an inner and outer layer;

whereby said cutter blade shears the layer of peat held on the filter material so that said outer layer is sheared off and returned to the field and said inner layer is carried into proximity to said means for removing where it is removed from said filter material for recovery.

4,554,751

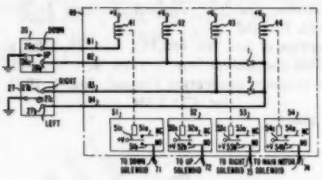
MULTI-FUNCTION VEHICULAR GEAR SHIFT LEVER FOR SNOWPLOW OPERATION

Carl T. Nicolosi, 191-B Beacon Hill Rd.; Thomas F. Nicolosi, 189-A Beacon Hill Rd., both of Morganville, N.J. 07751, and Ryan D. McCreedy, 46 Tindall Rd., Middletown, N.J. 07748

Filed Oct. 3, 1984, Ser. No. 657,084

Int. Cl.[4] E01H *5/04*

U.S. Cl. 37—234 **4 Claims**



1. Apparatus for substantially simultaneously controlling both a transmission of a vehicle to change the forward and reverse directions of movement of the vehicle, and lateral and/or elevational movement of a snow plow mounted to the vehicle, said apparatus comprising:

a lever for choosing a pre-defined one of a plurality of gears in said transmission to change the forward and reverse directions of movement of the vehicle, wherein one end of said lever is adapted to be grasped by a single hand of a driver of said vehicle, and

a selector for controlling the movement of said snow plow, wherein said selector is attached to said lever and situated in sufficient proximity to the end of the lever so that the driver is not required to substantially release the grasp of said single hand from the end of the lever in order to actuate said selector and thereby cause the snow plow to move in a desired direction.

4,554,752

HEATED CYLINDER IRONER UTILIZING A FLEXIBLE IRONING BED

John Bosshart, Coral Springs, and William W. Allen, Plantation, both of Fla., assignors to Jensen Corporation, Lauderdale, Fla.

Filed Apr. 25, 1985, Ser. No. 727,345

Int. Cl.[4] D06F *65/06*

U.S. Cl. 38—61 **7 Claims**

1. A heated revolving ironer and dryer comprising:

a revolving cylinder the outer surface of which provides a heated ironing surface;

a pair of power cylinders;

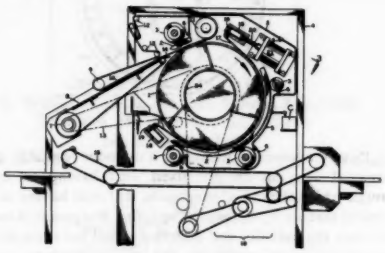
at least one flexible piece of heat resistant material surrounding a portion of the revolving cylinder forming the flexible ironing bed;

said flexible ironing bed reaching across the ironing surface of the revolving cylinder;

said flexible ironing bed having means to be anchored along the length of the revolving cylinder near the bottom of the revolving cylinder in the direction away from the direction of rotation of the revolving cylinder;

said flexible ironing bed having means along its upper edge to be affixed along the length of the revolving cylinder to the piston arms of said two power cylinders;

said power cylinders affixed adjacent to the opposite ends of the rotating cylinder substantially above the anchored lower edge of the flexible ironing bed such that the flexible ironing bed is drawn taut against the cylinder's ironing surface; and



said power cylinders capable of moving said pistons either toward or away from the direction of rotation of the revolving cylinder such that when in position away from the direction of rotation of the revolving cylinder, the flexible ironing bed is drawn taut against the ironing surface of the revolving cylinder thus performing the ironing function as the laundry work pieces are fed between the flexible ironing bed and the rotating cylinder, and when the movable piston is in the position toward the direction of rotation of the rotating cylinder, the flexible ironing bed gently brushes against the ironing surface thus conserving wear and energy when no laundry work pieces are fed into the ironer.

4,554,753

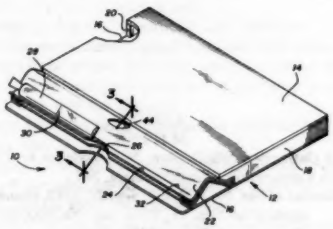
THIN-PROFILE COPY HOLDER

J. Garth Close, P.O. Box 168-6 SH, Malakoff, Tex. 75148

Filed Sep. 9, 1983, Ser. No. 530,194

Int. Cl.[4] B41J *11/38*

U.S. Cl. 40—341 **14 Claims**



1. An apparatus adapted to foster the efficient transfer of data into a computer by reducing the necessary eye travel as an operator switches his attention back and forth between a source of data on a flexible sheet and the entered data that is visible on a monitor screen, comprising;

(a) structural means adapted for supporting a monitor in front of a computer operator such that an operator may visually examine data that appears on a monitor screen

after the data has been entered into a memory associated with the computer, and said structural means having a frontal opening through which a flexible sheet of material may be pulled toward the operator, and further including a pair of generally parallel plates arranged one above the other, and the upper plate being configured to receive and support said monitor, and the lower plate being adapted to rest on a generally horizontal surface; and

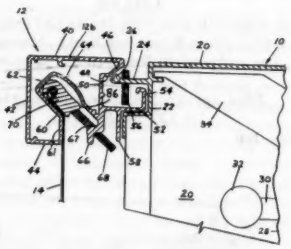
(b) support means for supporting a flexible sheet of material so that the material is folded into a generally U-shape adjacent the front of the structural means, and there being a frontal section of the support means about which the flexible sheet can be wrapped so as to expose to view a transverse portion of the flexible sheet near the bottom of the U, whereby data written on the flexible sheet may be periodically viewed by the operator as said sheet is progressively pulled through the support means and around the frontal section.

4,554,754

SIGN WITH FLEXIBLE FACE

Johann Stilling, Apt. #A1001, 1141 Royal York Rd., Islington, Ontario, Canada

Filed Jul. 6, 1984, Ser. No. 628,222
Int. Cl.[4] G09F *17/00*
U.S. Cl. 40—603 **11 Claims**



1. A face frame for a flexible sign panel the frame having four side members arranged in a generally rectangular shape said frame defining a front and a rear, and inner and outer frame portions, each side member comprising;

frame walls forming a partial enclosure;

channel walls located within the enclosure provided by said frame walls defining a channel having an axis directed with a vector lying from the rear to the front of said frame and a channel opening on the rearward end of said axis;

tension bearing means adjacent said channel opening on one side thereof;

shoulder means adjacent the other side of said channel opening;

clamp means adapted to grip the edge of said flexible sign panel, said clamp means being dimensioned to be slidable within said channel walls so that said clamp means may be slid into and out of said channel walls, and,

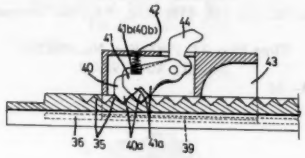
threaded adjustment means extending from said tension bearing means, and adapted to engage a portion of said clamp means, adjustment of said threaded adjustment means forcing said clamp means into said channel walls, whereby to tension said flexible sign panel around said shoulder.

4,554,755

SEATING DEVICE FOR FISHING REEL

Jeng-Hsiung Hsu, 10-11 Floor, No. 283, Tzu-Li I Rd., Kao-Hsiung City, Taiwan

Filed Dec. 1, 1983, Ser. No. 556,990
Int. Cl.[4] A01K *87/06*
U.S. Cl. 43—22 **2 Claims**



1. A reel seat for a fishing reel which has an attachment reel foot comprising;

a bar seat having arched attachment surfaces adapted to abut against the fishing rod; a hood member for receiving one end of the reel foot fixedly provided at one end of said seat; first toothed members provided on the upper side of said seat member; slide way means provided lengthwise on both sides of said seat member; and securing means including a casing having engaging surfaces for engaging said slide way means and slidable on said seat member, said casing having a socket for receiving the other end of the reel foot, pawl means pivotedly mounted on said casing, spring means normally biassing said pawl means to engage said first toothed members, and a hand operated means for moving said pawl means against the biassing action of said spring means, said pawl means including two pivoted parallel arms each of which has a second tooth, the distance between the tips of said second teeth in the longitudinal direction relative to the bar seat being half of the pitch of adjacent said first teeth.

4,554,756

FISHING HOOK SYSTEM HAVING A SEALED BAIT CONTAINER, AND METHOD OF MAKING SAME

Mit Thomas, P.O. Box 558, Malakoff, Tex. 75148

Filed Nov. 4, 1983, Ser. No. 548,649
Int. Cl.[4] A01K *97/02*
U.S. Cl. 43—44.99 **3 Claims**

1. A combination fish hook and packaged bait system, comprising:

a. a hook structure assembly having a barb and shank and including

b. a stiff spring action clip installed on said shank, and

c. a packaged bait container installed in said clip, and

d. an easily punctured section at a selected end of said container, wherein,

e. said clip is adapted to firmly grip and hold said bait container on the side of said shank adjacent to and in the vicinity of, but separate from and not engaging said barb, wherein

f. said container is divided into compartments separated by a rigid block, and

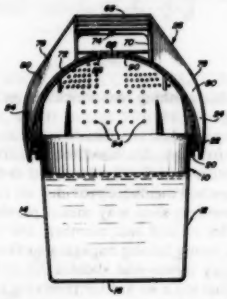
g. wherein said container is tubular in shape and said block is rigid and circular and is snugly fitted into said container, and wherein said block reinforces said package when installed in said clip.

4,554,757

TROLLING BUCKET

Daniel Sakuta, Jr., 560 44th Ave. NE., St. Petersburg, Fla. 33703

Filed May 11, 1983, Ser. No. 493,510
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 **3 Claims**



1. A bait container including an upwardly opening bucket, a domed cover removably engagingly stationarily supported from and closing the open upper end of said bucket, a pivoted bail-type handle supported from said bucket and swingable between an upstanding position over the upper portion of said domed cover and a generally horizontal position disposed to one side of said cover, said cover being readily removable when said handle is in said horizontal position, said handle and cover including coacting means for releasably latching said handle in said upstanding position, said handle, when in said upstanding position, serving to latch said cover to said bucket against removal therefrom, an upper portion of the side opposite said one side of said domed cover including an access opening formed therein, closure means shiftably supported from said domed cover and movable into and out of position closing said access opening, said one side of said domed cover including water ingress openings formed therein, said bail-type handle including a pair of remote arm end portions pivotally supported from opposite sides of said bucket, the arms of said handle comprising solid web-like portions defining water fin means substantially coincident with the medial plane of said handle, said handle including a central portion defining anchor structure to which one end of a tether line may be releasably anchored; said web like portions extending from either side of said anchor structure substantially to the outer surface of said domed cover in an uninterupted manner, and tapering toward said opposite sides of said bucket so as to establish an effective hydrofoil surface for trolling when in said upstanding position.

4,554,758

TUNNEL TRAP

Michael P. Molloy, Cedar Park, Tex., assignor to Bobby Lockhart and O. D. Bradsher, Jr., both of Austin, Tex., part interest to each

Filed Sep. 23, 1983, Ser. No. 535,286
Int. Cl.[4] A01M *23/08, 23/18*
U.S. Cl. 43—61 **15 Claims**

1. A tunnel trap, comprising:

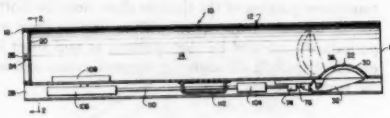
an elongated tubular housing defining an interior space and having front and rear ends, said housing having a lateral side with an opening;

a rear cover coupled to said housing for closing said rear end;

a door pivotally mounted in said housing adjacent said front end for movement between an open position permitting access to said housing interior space through said front end and a closed position closing said housing adjacent said front end, said opening receiving said door in said open position;

spring means, coupled to said door, for biasing said door toward said closed position;

first latch means, releasably engageable with said door, for maintaining said door in said open position against the bias



of said spring means, said door comprising support member fixed to said housing lateral side adjacent said opening, a pair of door brackets pivotally coupled to said support member about a first pivot axis, said brackets having a latch member attached directly thereto matable with said first latch means, said latch member extending parallel to and spaced from said first pivot axis, and a door panel mounted on said brackets; and

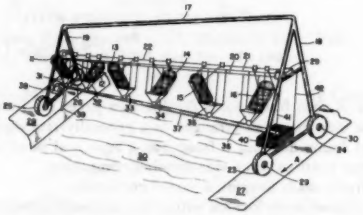
trigger means, coupled to said first latch means, for moving said first latch means to a release position releasing said door for movement to said closed position under action of said spring means.

4,554,759

METHOD AND MEANS FOR HARVESTING CRAYFISH

Robert J. Edling, Baton Rouge, and Karl L. Morgan, Fort Allen, both of La., assignors to Research Corporation, New York, N.Y.

Filed Apr. 12, 1983, Ser. No. 484,154
Int. Cl.[4] A01K *69/06*
U.S. Cl. 43—100 **23 Claims**



1. An aquatic harvester for attracting and collecting edible decapod crustacean from an aquatic bed, said harvester comprising:

(a) a plurality of one way trap means for attracting and collecting edible decapod crustacean

(b) a support means for raising and lowering said plurality of trap means from a first position in engagement with an aquatic bed to a second position for discharging the collected crustacea;

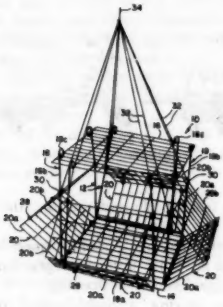
(c) a collection means for receiving the collected crustacea from each of said one way traps when said traps are discharged;

(d) a means for conveying said collected crustaceans to a single storage means;

(e) a means for intermittently moving said support means along the aquatic bed to enable the traps to be reset on the aquatic

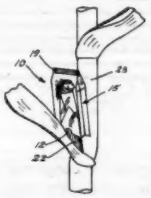
bed by said support means during intermittent stationary periods.

4,554,760
CRAB TRAP
Charles Ponzo, 37 Abby La., Shirley, N.Y. 11967
Filed Dec. 12, 1983, Ser. No. 560,339
Int. Cl.[4] A01K *69/10*
U.S. Cl. 43—105 **1 Claim**



1. A trap for a crab, comprising:
(a) framing means including four U-shaped members;
(b) a wire mesh bottom panel having corners and sides and connected to said framing means by rings;
(c) a wire mesh top panel displaced a distance from said bottom panel, connected to said framing means, and having a size and shape substantially identical to and being parallel to said bottom panel;
(d) a plurality of collapsible doors pivotally and slidably connected by rings to said framing means and to said sides of said bottom panel, said plurality of collapsible doors being pivotally connected to said framing means by said rings that attach said bottom panel to said framing means, said plurality of collapsible doors being slidably connected in an up and down direction to said framing means so that said plurality of collapsible doors are prevented from being fouled either by being pulled into the trap or being forced below the trap, said each collapsible door of said plurality of collapsible doors having a height substantially equal to the distance by which said top panel is displaced from said bottom panel, said each collapsible door of said plurality of collapsible doors comprising a wire mesh lower panel pivotally connected to said side of said bottom panel and said base portion of said U-shaped member and a wire mesh upper panel pivotally connected to said lower panel and being slidably connected to said pair of arms of said U-shaped member with said ends of said flexible hoist line attached thereto so that when said each collapsible door collapses said upper panel will fold outwards onto said lower panel, each U-shaped member of said four U-shaped members comprising a base portion extending along a side of said sides of said bottom panel and onto which a collapsible door of said plurality of collapsible doors is pivotally connected and a pair of arms having free ends extending upwards from two corners of said corners of said bottom panel and onto which a collapsible door of said plurality of collapsible doors is slidably connected and loops disposed on said free ends of said pair of arms for affixing said top panel to said framing means; and
(e) a hoist line having ends connected to each of said plurality of collapsible doors so that when the trap is submerged and said hoist line is slacked said plurality of collapsible doors open flat allowing the crab to enter the trap and when said hoist line is pulled taut said plurality of collapsible doors slide up said framing means and close the trap which entraps the crab within.

4,554,761
POLLINATING BAG
Joseph M. Tell, West Des Moines, Iowa, assignor to Carpenter Paper Company, Des Moines, Iowa
Filed Jun. 1, 1984, Ser. No. 616,246
Int. Cl.[4] A01G *7/00*
U.S. Cl. 47—1.41 **6 Claims**



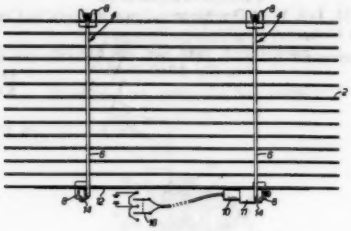
1. A plant reproductive organ antipollination barrier cover comprising:
cover means constructed of a transparent, uncoated, heat sealing, vented polypropylene film for extending over and around a plant reproductive organ for selectively preventing said reproductive organ from pollination, said cover means including:
a front panel;
a rear panel;
first side closure means for sealingly connecting said front and rear panels along one side thereof, said side means including a first and second side panel;
first crease means for biasing said first side panel and said rear wall towards each other;
second crease means for biasing said first and second side panels towards each other;
third crease means for biasing said second side panel and said front panel toward each other;
second side closure means for sealing connecting said front and rear panels along the other side thereof; and
end closure means for sealing one end of said front and rear side panels and said first and second side means with respect to each other whereby said one end will be sealed to prevent the entry of pollen into said one end of said closure means, and wherein said front wall, rear wall, first side panel and second side panel are all secured together along a substantially straight seam oriented transversely with respect to said first, second and third crease means and wherein said first, second and third crease means extend to said seam.

4,554,762
ELECTRICALLY POWERED SUN BLIND
Robert W. Anderson, Hexham House, Shields Rd., Cleadon Village, South Shields, Tyne & Wear, England
Continuation of Ser. No. 472,480, Mar. 7, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 722,418
Int. Cl.[4] E06B *7/086*
U.S. Cl. 49—76 **8 Claims**

1. An electrically powered sun blind adapted for use in the rear window of a vehicle, comprising:
(a) a plurality of parallel slats;
(b) at least two slat support devices, each of said slat support devices including a pair of rigid parallel side pieces interconnected by a series of slat supporting cross-pieces each supporting a slat and pivotally connected at its ends to said side pieces so that said side pieces are adapted to move relative to one another in parallelogram fashion to establish the angle of said slats, each of said cross-pieces being shaped to cooperate with the next adjacent cross-piece so

as to form an integral abutment means to limit the range of angular movement of the blind; and

(c) an electrically powered motor having a casing and an output shaft rotatably movable with respect to each other,



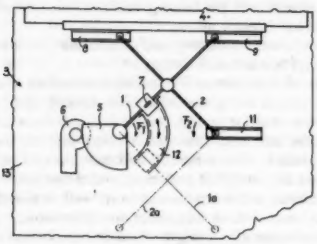
said casing being fixedly connected with a cross-piece of one of said slat support devices and said output shaft being fixedly connected to a fixed mounting of the blind, said relative rotation being parallel to the movement of said slat support device.

4,554,763

ELECTRIC GLASS-RAISING DEVICE FOR A MOTOR VEHICLE

Jean Dauvergne, Sully sur Loire, France, assignor to Compagnie Industrielle de Mechanismes, France

Filed Dec. 14, 1983, Ser. No. 561,428
Claims priority, application France, Dec. 14, 1982, 82 20946
Int. Cl.[4] E05F *15/08, 11/44*
U.S. Cl. 49—349 **8 Claims**



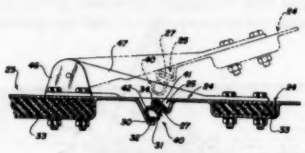
1. An electric glass-raising device for a door of a vehicle, said device comprising two arms arranged in an X-configuration and disposed inside said door and supporting the glass, one of said arms being a driving arm and the other arm being a driven arm, a support fixed to said driving arm adjacent a first end of said driving arm and rotatably mounted relative to said door, a motor-speed reducer unit drivingly connected to said support for rotating said support, control means for actuating the unit, said driving arm having a second end opposed to said first end, a first slideway, a second slideway and a third slideway, the first and second slideways being connected to the glass and the third slideway being mounted on said door, said second end of said driving arm being slidably mounted in said first slideway, said driven arm having opposed ends respectively slidably mounted in said second slideway and said third slideway, said control means being connected to said driving arm in such manner as to be kinematically related thereto, an inner trimming panel on the door, means defining a slot in said panel, said control means projecting through said slot, said slot having a length allowing travel therein of said control means in movement of said glass between opposed end positions of said glass.

4,554,764

GASKET-SEALED MOLDED DOOR AND FRAMING MEMBER THEREFOR

Donald Jenkins, Louisiana, Mo., assignor to Astoria Fibra-Steel, Inc., Astoria, Ill.

Division of Ser. No. 181,174, Aug. 25, 1980, Pat. No. 4,366,611.
This application Sep. 27, 1982, Ser. No. 424,157
Int. Cl.[4] E06B *3/00*
U.S. Cl. 49—501 **1 Claim**



1. For use as a truck body and the like, the combination comprising

a framing member having a mold-formed outer surface bounded by an inwardly sloping integral flange terminating in a cut edge defining an opening,

a door member having a mold-formed outer surface bounded by a generally V-shaped integral flange having an outwardly and forwardly sloping outer end portion terminating in a cut outer edge,

the inner dimensions of said framing member taken along its said cut edge being so little larger than the outer dimensions of said door member along its cut outer edge as to permit the door member and framing member to be cut from a single intermediate molded article, and

a gasket having a channel portion on one edge thereof and a cushioning portion on an opposite edge,

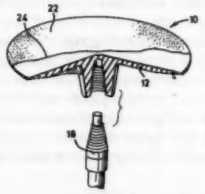
the door member having mounted, about its said sloping outer end portion, the channel portion of said gasket in a manner so that its said cushioning portion underlies an inner surface of said door outwardly and forwardly sloping outer end portion and, on presenting the door member forwardly of and adjacent to the sloping flange of the framing member, said gasket cushioning portion faces and is compressed against an outer surface of said framing member inwardly sloping flange.

4,554,765

COATED ABRASIVE DISC

Philip M. Grimes, 15 McMurrich St., Toronto, Ontario, M5R 3M6, and John R. Grimes, 33 Harbour Sq., Toronto, Ontario, M5J 2G2, both of Canada

Continuation-in-part of Ser. No. 471,698, Mar. 3, 1983, Pat. No. 4,525,177. This application Mar. 12, 1984, Ser. No. 588,580
Int. Cl.[4] B24D *11/00*
U.S. Cl. 51—401 **2 Claims**



1. A one-piece coated abrasive grinding assembly for mounting on a shaft to be rotated by a power tool, the grinding assembly having an abrasive grinding face for grinding a work-

piece surface and having a periphery useful for grinding a groove in a workpiece, the grinding assembly comprising:

(a) a disc made of thermoplastic material and having a thickened hub portion for receiving said shaft and having an integral flexible workpiece-contour-following disc portion disposed normal to the hub portion and extending to the periphery of the disc, the diameter of the flexible disc portion being great as compared with its thickness;

(b) a layer of thermosetting plastic resin which contains abrasive grit coated directly on the workpiece-contour-following disc portion which comprises said grinding face, the plastic resin being compatible with the thermoplastic material of the disc portion and being bonded and adhesively fused thereto; and

(c) the thermoplastic disc material being smoothly and continuously heat-disintegrated at the same rate as the plastic resin grit-containing layer is abraded away when the periphery of the disc portion is used for edge grinding a workpiece, whereby to present fresh grinding grit to the workpiece as the diameter of the disc portion decreases.

4,554,766

CEILING CONSTRUCTION FOR CLEAN ROOMS

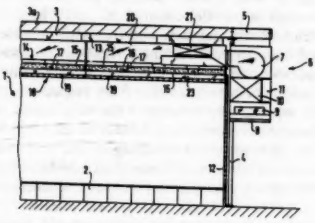
Wolf Ziemer, Berlin, and Wilhelm Hölle, Münzenberg, both of Fed. Rep. of Germany, assignors to Flakt Aktiebolag, Nacka, Sweden

Filed Aug. 20, 1984, Ser. No. 642,426

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330536

Int. Cl.⁴ E04H *5/02*

U.S. Cl. 52—28 **6 Claims**



1. Ceiling construction for clean rooms comprising:

an intermediate ceiling arranged at a spacing beneath a raw ceiling to form a pressure chamber, which intermediate ceiling is formed from heavy duty mechanical filters:

a lower ceiling arranged at a spacing beneath the intermediate ceiling to form an air distribution chamber, which lower ceiling is formed from laminar elements having vertical passages for a vertically downwardly directed air flow: and ceiling lamps,

wherein

the laminar elements of the lower ceiling are formed by a capillary structure which is both air permeable and also light permeable, and

the ceiling lamps are installed above the lower ceiling between the mechanical filters.

4,554,767

EARTHQUAKE GUARDING SYSTEM

Aristarchos S. Ikonomou, 90 Evrou St., Athens 609, Greece

Continuation of Ser. No. 231,754, Feb. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 201,803, Oct. 29, 1980, abandoned. This application May 18, 1984, Ser. No. 611,751

Int. Cl.⁴ E04B *1/98*

U.S. Cl. 52—167 **25 Claims**

1. A structure having a superstructure and isolation means for isolating said superstructure from the ground during an earthquake or other strong oscillations of the ground, said isolation means comprising:

a first load distributing base;

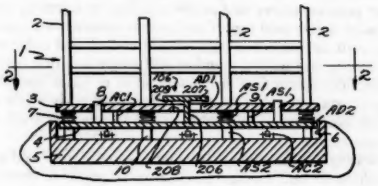
a second load distributing base substantially parallel to said first load distributing base;

one of said load distributing bases supporting said superstructure and the other of said load distributing bases being between said one load distributing base and the ground;

first elastic means;

second elastic means;

said first elastic means connecting said one load distributing base and said other load distributing base and said second elastic means connecting said other load distributing base and the ground;



means substantially preventing shearing movement between the components connected by one of said elastic means without preventing rotational movements, between said components, which are substantially only around a horizontal axis and translational movements, between said components, which are substantially perpendicular to said load distributing bases,

the said structure being constructed and arranged so as to allow, between the components connected by said other elastic means, only translational movements substantially parallel to said load distributing bases and rotational movements around a vertical axis,

whereby the respective elastic means provide isolation.

4,554,768

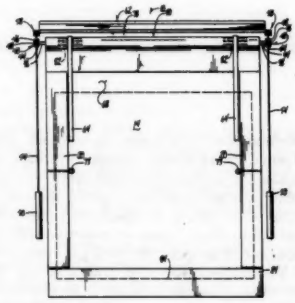
DOCK SEAL WITH ADJUSTABLE TOP SEAL

Reinhard Srajer, Colorado Springs, Colo., assignor to Woodford Manufacturing Company, Colorado Springs, Colo.

Filed Apr. 21, 1983, Ser. No. 487,063

Int. Cl.⁴ E04H *14/00*

U.S. Cl. 52—173 DS **15 Claims**



1. A loading dock adjustable top seal for providing a weather-tight seal between the top of a vehicle and the top of a loading access opening of a loading dock associated with a building when said vehicle is in an abutting relationship against said building comprising:

a vertically adjustable horizontal top sealing member having

an elongated body extending across the width of said loading access opening;

a curtain means having an upper and a lower edge, said upper edge being attached to an attachment means mounted across and above said loading access opening, said lower edge being attached along said elongated body;

cable drum means mounted to said elongated body;

sheave means mounted above said access opening;

cable means having a first end connected to said cable drum means, said cable means extending over said sheave means and thence downwardly and terminating in a second end;

said cable means being wrapped around said drum means in a first direction and said curtain means being wrapped around said elongated body in a second direction opposite from said first direction;

said sealing member being movable downwardly from a storage position above said access opening to a sealing position spaced below said top of said access opening in response to upward movement of said second end of said cable means, whereby said sealing member will rotate in a first rotational direction during said movement so as to cause unrolling of said curtain member from said elongated body while at the same time causing said cable means to wind up around said drum means;

said sealing member being movable upwardly from said sealing position to said storage position in response to downward movement of said second end of said cable means whereby said sealing member will rotate in a second rotational direction opposite from said first rotational direction so as to cause rolling up of said curtain member around said elongated body while at the same time causing unwinding of said cable means from around said drum means;

said top sealing member being an elongated horizontally positioned cylindrical member;

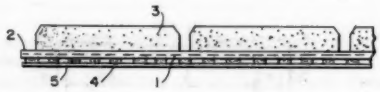
at least one strap member having a first end attached to said top sealing member and having an opposite second end extending downwardly and freely from said top sealing member into said loading access opening.

4,554,769

ADHESIVE-BACKED TILE PANELS AND METHOD FOR INSTALLATION THEREOF

Morizumi Fujii, Nagoya; Hirofumi Kakimoto, and Shinji Fujino, both of Fukuyama, all of Japan, assignors to Ina Seito Co., Ltd., Tokoname, Japan

Filed Mar. 24, 1983, Ser. No. 478,413
Int. Cl.[4] E04F *13/08*
U.S. Cl. 52—173 R **11 Claims**



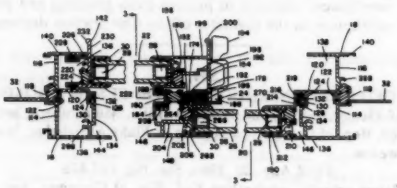
1. A prefabricated title panel having side dimensions of about 300 mm or more which consists essentially of a substrate sheet composed of a core nonwoven fabric and a heat-softening-adherent polymer-modified asphalt material applied to both surfaces of the fabric, the thickness of the substrate sheet being about 0.5 to about 3 mm; an adhesive layer having convex and concave stripe portions with gaps therebetween comprising a heat-melting adhesive which is not flowable but sticky at an ambient temperature in the form of stripes adhered to one surface of the adherent material of the substrate sheet, said convex and concave stripe portions having such a thickness and being arranged at such an interval that the panel can be bonded firmly to a substrate board and air present between the back surface of the panel and a substrate board upon installation thereof can be purged through the gaps between the convex portions and the concave portions of the adhesive layer, an area coverage ratio of the convex stripes being about 30% to about 70%, the width and interval of the stripes being in the range of about 2 to about 8 mm, the convex stripes having a thickness of about 0.5 to about 3 mm; said adhesive layer being protected by a release sheet; and a multiplicity of ceramic or porcelain tiles arranged regularly and secured by heating to the other surface of the adherent material of the substrate sheet.

4,554,770

HORIZONTAL SLIDING WINDOW WITH REMOVABLE FIXED SASH

Dennis F. Anders, Lexington, N.C., assignor to National Gypsum Company, Dallas, Tex.

Filed Jan. 11, 1984, Ser. No. 569,998
Int. Cl.[4] E05D *15/08*
U.S. Cl. 52—207 **20 Claims**



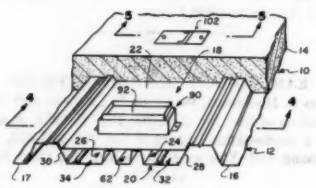
1. A horizontal sliding window comprising a frame sill member, a frame head member and at least two removable, normally side by side, spaced, parallel sashes, said two sashes being mounted in parallel channels in said frame sill member and said frame head member, said frame sill member and said frame head member each having a rigid strip disposed therein which separates said parallel channels in said frame members, said two sashes being removable from respective channels in said frame members by raising of the said sashes out of said frame sill member channels and further up into said frame head member channels followed by tilting of said sashes and lowering of said sashes out of said frame head member channels, said window further comprising an intermediate interlock rail disposed in a plane between said spaced parallel sashes, said interlock rail sealingly engaging two spaced parallel sashes when said two sashes are in normal, side by side positions, said interlock rail having sealing elements on two opposed sides which sealingly engage said two sashes in a sealing relationship which extends completely from said rigid strip in said frame sill member to said rigid strip in said frame head member.

4,554,771

FIELD-ASSEMBLED CELLULAR DECKING UNIT

Ashok K. Marwah, Pittsburgh, and Charles H. Norris, Jr., Wexford, both of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Jul. 2, 1984, Ser. No. 626,887
Int. Cl.[4] H02G *3/28*; E04B *5/48*
U.S. Cl. 52—221 **11 Claims**



1. A cellular decking unit comprising:

a lower metal sheet having at least one upwardly projecting rib

presenting opposite rib faces, and lower sheet portions extending from said rib faces and terminating in marginal connectors; and

an upper metal sheet engaged with said rib and having upper sheet portions cooperating with said opposite faces and said lower sheet portions to define laterally open channels, each of said channels being adapted to receive and be closed by a side portion of an adjacent decking unit to form an enclosed raceway.

4,554,772

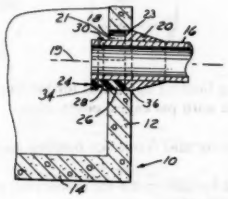
BOOT GUARD FOR SEWER MANHOLE CONSTRUCTION

Gary F. Labenz, 11938 Big Lake Rd., Davisburg, Mich. 48019

Filed Feb. 8, 1984, Ser. No. 578,157

Int. Cl.[4] E04B *1/62*

U.S. Cl. 52—396 **1 Claim**



1. In a sewer manhole construction including a cylindrical bottom section adapted for placement within the ground at a predetermined depth, said bottom section having a vertically extending side wall and a horizontal bottom wall, an opening having a horizontal axis extending through the side wall and being vertically spaced from said bottom wall, and at least one sewer pipe having an end extending into and through said opening in said vertical side wall, said end of the sewer pipe having the same horizontal axis as said opening and being spaced from the wall surface defining the opening by an annular recess, a flexible annular seal surrounding the sewer pipe and including an annular rim portion which extends into said annular recess adjacent where the end of the sewer pipe enters the opening in the side wall and seals said opening, the improvement comprising a boot guard fitted onto said end of the sewer pipe, said boot guard including a generally half-circle, annular base portion having an undercut peripheral groove therein and a pair of first and second end surfaces, said groove being located near said first end surface, said base portion extending into said annular recess with said second end surface abutting said flexible seal, said guard including a flexible securing band located in said undercut groove and wrapped around the upper periphery of said end of the sewer pipe for holding said base portion in place ins aid side wall prior to concrete being poured into the bottom section of said manhole construction, said boot guard when concrete is poured into said bottom section preventing contact between the concrete and said flexible seal and also preventing contact between the concrete and said end of the sewer pipe for maintaining the flexibility of said flexible seal and permitting easier removal of said sewer pipe for repair or replacement.

4,554,773

DEVICE AND METHOD FOR SECURING OVERLAPPING CORRUGATED SHEETS

John L. Conley, 3870 Chino Ave., Chino, Calif. 91710

Filed Apr. 30, 1984, Ser. No. 605,295

Int. Cl.[4] E04B *1/74*

U.S. Cl. 52—521 **17 Claims**

1. Fastening means for joining the edges of corrugated sheets together, said means include:

a fastener plate having:

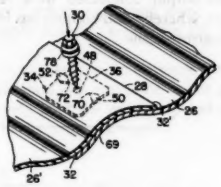
an arcuate body with:

a first edge;

a second opposite edge; and

a screw receiving orifice positioned between said first and second edges; and

first and second prongs extending at right angles to said



arcuate body from said first and second edges respectively, each prong having:

a piercing point extending away from said arcuate body;

a central portion; and

a connecting portion attaching said central portion to said edge, said connecting portion being narrower than said central portion.

4,554,774

SYSTEM FOR SYNCHRONIZING TWO OR MORE PROCESS UNITS

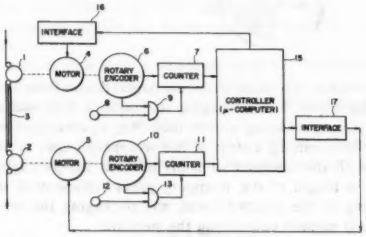
Yoshikazu Miyashita; Shiaru Muranaka, and Hideo Tanaka, all of Kanazawa, Japan, assignors to Shibuya Kogyo Co., Ltd., Ishikawa, Japan

Filed Apr. 25, 1984, Ser. No. 603,538

Claims priority, application Japan, Apr. 30, 1983, 58-76985; Apr. 30, 1983, 58-76986

Int. Cl.[4] B65B *57/20*

U.S. Cl. 53—52 **6 Claims**



1. A system for synchronizing the operation of at least first and second process units, comprising:

first driving means for driving said first process unit;

second driving means for driving said second process unit;

first detecting means operatively coupled to said first process unit and said first driving means for supplying a first signal by detecting timing of the operation of said first process unit;

second detecting means operatively coupled to said second process unit and said second driving means for supplying a second signal by detecting timing of operation of said second process unit; and

control means responsive to said first and second signals for controlling the operating conditions of said first and second driving means thereby keeping said first and second process units synchronized,

wherein each of said first and second detecting means includes a rotary encoder driven to rotate by the corresponding motor, a counter for counting the number of step

pulses generated by said rotary encoder, a detector for supplying a detection signal upon detection of completion of a unit operation at the corresponding process unit, and an AND gate having its first input connected to receive a zero point pulse generated by said rotary encoder, its second input connected to receive said detection signal and its output connected to a reset terminal of said counter, whereby said counter has its output connected to said control means.

4,554,775

METHOD OF FEEDING A SPECIFIC LENGTH OF WRAPPING PAPER FOR A COIN PACKAGING MACHINE AND DEVICE FOR CARRYING OUT SAID METHOD

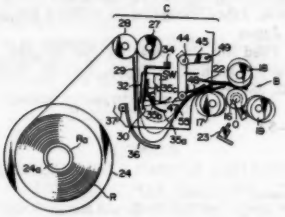
Kazuto Asami; Takao Baba; Minoru Nakamura, and Mitsuaki Tanaka, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Nov. 12, 1982, Ser. No. 441,126

Claims priority, application Japan, Nov. 12, 1981, 56-181392

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—64 **18 Claims**



1. A method of feeding wrapping paper, drawn from a roll of wrapping paper, to a packaging section in a coin packaging machine, the packaging section including a plurality of wrapping rollers, cutting a strip of the wrapping paper in accordance with the diameter of coins selected for packaging to provide a length of the wrapping paper sufficient to assure packaging of the selected coins, and packaging the selected coins, said method comprising the steps of:

(a) activating feed rollers to feed the leading edge of the wrapping paper past a cutting knife and past a guide passage which comprises a movable guide wall along which the paper slides to the packaging section;

(b) retaining the wrapping paper in a predetermined position along the guide passage;

(c) displacing the movable guide wall from a guide position to a second position to elongate the guide passage for the web while activating the feed rollers to feed an additional amount of the wrapping paper in accordance with the diameter of the selected coins to provide the sufficient length of the wrapping paper; and subsequently

(d) holding the leading edge of the wrapping paper firmly between the outer cylindrical surface of a stack of the selected coins and the wrapping rollers; and

(e) activating the wrapping rollers to wrap the wrapping paper about the stack of the selected coins, pulling the wrapping paper against the cutting knife to cut off the sufficient length of the wrapping paper, thereby packaging the selected coins.

4,554,776

PACKAGE BAG BINDING APPARATUS

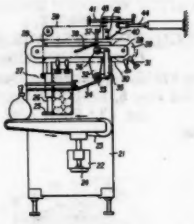
Hajime Chikatani, Hachioji, Japan, assignor to Kabushiki Kaisha Daisei Kikai, Tokyo, Japan

Filed Feb. 16, 1983, Ser. No. 467,172

Claims priority, application Japan, Feb. 19, 1982, 57-25657; Aug. 7, 1982, 57-137543

Int. Cl.[4] B65B *57/00*

U.S. Cl. 53—76 **2 Claims**



1. A package bag binding apparatus for binding openings of package bags filled with packages, comprising:

a frame;

means supported by said frame for binding an opening of a package bag;

means supported by said frame for conveying package bags to said means for binding;

means supported by said frame for detecting a filling level of a package bag; and

means responsive to said means for detecting, and operatively connected to said means for binding, for selectively vertically moving said means for bindng to a vertical filling position for filling a package bag having a detected filling level; and

means operatively connected to said means for binding for lifting said means for binding to a lifted position and holding said means for binding in said lifted position,

wherein said means for vertically moving comprise:

(a) means responsive to said means for detecting for releasing said means for binding from said lifted position,

(b) means for lowering said means for binding, and

(c) means for stopping said means for binding at said filling position.

4,554,777

CONVERTIBLE-FORMAT PACKAGING MACHINE

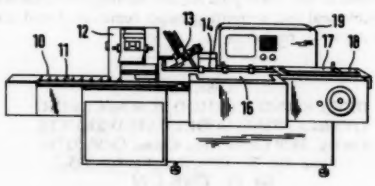
Josef Denk, Waiblingen; Walter Dietrich, Weinstadt, and Otto Weller, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 24, 1984, Ser. No. 653,624

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339924

Int. Cl.[4] B65B *59/00*

U.S. Cl. 53—201 **7 Claims**



1. A packaging machine having devices for conveying, shaping and handling the packages, and for delivering the

products to be packaged in which structural parts which are displaceable with set screws and adjustable to various formats of products and packages are provided at a plurality of change-over locations, characterized in that said set screws each have an identical coupling part arranged to receive a mobile drive mechanism, said mobile drive mechanism further including a coupling counterpart which can be coupled with said set screws, and further that said mobile drive mechanism can be connected with a control unit, in which adjustment values of various package formats are stored for the various structural parts.

4,554,778

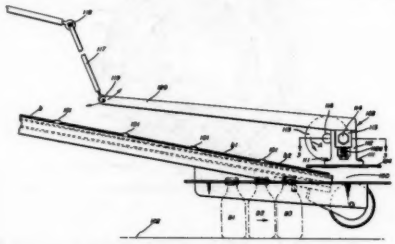
PACKAGING MACHINE AND METHOD

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 1, 1984, Ser. No. 636,831

Int. Cl.[4] B65B *21/24*

U.S. Cl. 53—398 **12 Claims**



1. A machine for packaging a group of bottles in a wrap around carrier blank having a top wall, side walls and bottom lap panels, said top wall having apertures formed therein for receiving the necks of said bottles, said machine comprising means for continuously moving the bottle group along a predetermined path, continuously movable chain means for continusly moving a carrier blank above said predetermined path in downwardly converging relation therewith and into a position immediately above the bottle group, and presser means disposed above the bottle group and including a rotatable shaft whose axis is substantially normal to said predetermined path and a crank fixedly secured to said shaft, the end of said crank remote from said shaft being continuously movable in a circular path, said presser means also including blank engaging means movable downwardly and forwardly in the direction of movement of the bottle group and of the blank during the lower part of its path of movement for engaging and pressing the blank downwardly to cause said apertures to evelope the bottle necks while the bottle group and blank are moved continuously along said predetermined path.

4,554,779

MACHINE FOR STRAPPING PACKAGES AND THE LIKE

Charles Fischer, Wohlen, Switzerland, assignor to Strapex AG, Wohlen, Switzerland

Filed Jun. 19, 1984, Ser. No. 622,290

Claims priority, application Switzerland, Jun. 21, 1983, 3386/83

Int. Cl.[4] B65B *13/10*

U.S. Cl. 53—589 **15 Claims**

1. A machine for strapping packages with a ligature in the form of a strapping band having a band starting portion, comprising:

a strapping tunnel for receiving the package which is to be tied with the strapping band;

an endless belt movable around said package along a predetermined path;

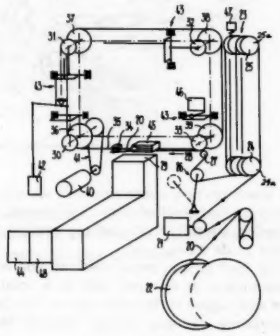
means for continuously moving said belt around the package;

a carriage supported by said endless belt when engaged therewith, a strapping band clamp mounted on said carriage to clamp the band starting portion;

the carriage being moveable along said predetermined path of travel in order to guide the band starting portion around the package for forming a band loop;

a strapping band-supply roll for supplying the strapping band;

band holder means moveable so as to protrude into a plane containing the band loop and moveable out of said plane in order to selectively hold the band loop and to release the same so as to encircle the package;



intermediate storge means containing a return storage capacity for taking-up band slack arranged between the strapping band-supply roll and the path of travel;

a clamping device for fixedly retaining the ends of the strapping band which has been laid about the package;

a releasable coupling device for uncoupling the carriage from the continuously revolving belt;

an actuation device for actuating the releasable coupling device;

a closing device for the strapping band to interconnect the ends of the strap;

said actuation device being arranged at the region of the clamping and closing devices; and

a positioning device for driving and positioning the uncoupled carriage in adjacent to the clamping and closing device.

4,554,780

POWER TRANSMISSION APPARATUS IN MOBILE TYPE LAWN MOWER

Hiroshi Umeno, Higashikurume; Gunji Saito, Tokorozawa, and Morimasa Hayashida, Kodaira, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,731

Claims priority, application Japan, Oct. 20, 1982, 57-157488[U]

Int. Cl.[4] A01D *53/00*

U.S. Cl. 56—11.8 **9 Claims**

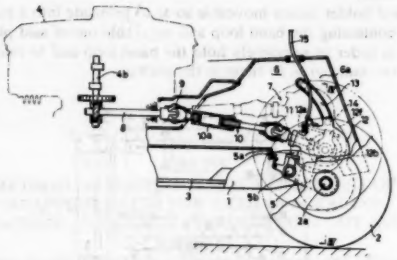
1. A power transmission apparatus for a power driven lawn mower, said mower having a housing, an engine mounted upon said housing, a mowing blade coupled to said engine, and wheel means comprising a shaft and a pair of wheels mounted on said shaft, said wheel means being swingably mounted on said housing, whereby the swinging of the wheel means adjusts the distance of said housing from the surface on which the wheels rest, said power transmission apparatus comprising:

(a) a power transmission chamber formed on one side of a portion of said housing, having a guide means in the form

of an arcuate groove integral with a side portion of said transmission chamber;

(b) a transmission mechanism comprising an input shaft means coupled to said engine, a first gear means coupled to said input shaft, and a second gear means coupled to said first gear means and to said shaft of said wheel means;

(c) a reduction gear means casing for housing said transmission mechanism, said casing comprising an upper portion containing said first gear means and receiving said input



shaft, a lower portion containing said second gear means and receiving said shaft of said wheel means, and a guide pin extending laterally from said top portion and engagable in said guide means; and

(d) a driving shaft means, connectable to said input shaft of said transmission at one end and to a rotatable output means of said engine at the opposite end, having means for accommodating changes in the distance between said engine and said input shaft.

4,554,781

AIRBORNE TREE TRIMMER

Randall Rogers, deceased, late of Pea Ridge, Ark. (by Mary L. Rogers, administrator), assignor to Aerial Solutions, Inc., New Roads, La.

Filed Jun. 25, 1984, Ser. No. 623,882
Int. Cl.[4] A01D *55/18*
U.S. Cl. 56—235 **23 Claims**

1. Airborne tree trimmer apparatus for installation on a helicopter or the like comprising

a power source carried by said helicopter,

boom mounting structure attachable to the underside of said helicopter,

a boom pivotally mounted thereto about at least one horizontal pivot axis, saaid boom being restrained from rotation about a vertical axis,

a plurality of wood cutting means mounted on said boom,

at least one motor attached to said boom and connected to drive said cutting means, and

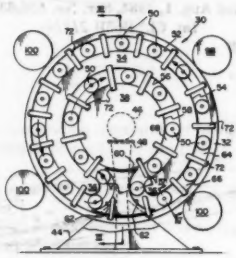
power transmission means connected between said power source and said motor.

4,554,782

MANUFACTURE OF TELECOMMUNICATIONS CABLE CORE UNITS

John N. Garner, Kingston, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 3, 1984, Ser. No. 637,586
Int. Cl.[4] H01B *11/04;* **D01H** *1/04;* **D07B** *1/06, 3/12*
U.S. Cl. 57—66 **2 Claims**



1. Apparatus for forming a core unit from telecommunications conductor units, each formed from twisted together insulated conductors and in which the relative positions of the conductor units are changed along the core unit, the apparatus comprising, in order downstream along a feedpath for the conductor units:

guide means for the conductor units to prevent them from being twisted together;

position changing means for conductor units comprising an arcuate member surrounded by a rotatable annulus and an inner member, the position changing means defining an endless guide channel which extends transversely of the feedpath in a plurality of directions, the guide channel having an arcuate outer channel portion defined between the arcuate member and the annulus and an inner channel portion defined between the arcuate member and the inner member, the two portions subtending an angle of less than 360° around the axis of the annulus and interconnected at their ends by interconnecting channel portions extending around the ends of the arcuate member and defined between the arcuate member and a spacing member, the spacing member and inner member being mounted in position to a fixed support, the position changing means also comprising guides for conductor units held in laterally spaced positions in the channel, said guides maintaining the relative positions of the annulus, arcuate member, inner member and spacing member, and means to move the guides along the channel in their spaced positions for a certain distance alternately in each direction so that the guides are moved from channel portion to channel portion with guides in one channel portion changing in their positional relationship to those in the other, said guide moving means comprising a chain and sprocket drive, the chain being continuous and extending around the inner surface of the annulus, around the interconnecting channel portions and then around the inner member, the guide means also comprising a fixed chain provided around the circumference of the arcuate member, and each guide is provided with a sprocket of the guide moving means, which sprocket engages with both chains, and means is provided to drivably rotate the annulus; and

a core unit forming and take-up means to draw the conductor units together to form the core unit.

4,554,783

LINK FOR WATCH BAND AND BRACELET

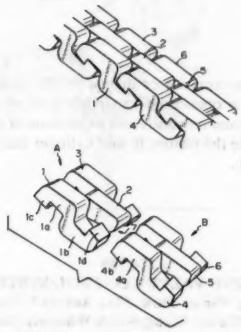
Eisuke Yokoyama, Tokyo, Japan, assignor to Kawaguchiko Seimitsu Company Limited, Yamanashi, Japan

Filed Jul. 11, 1983, Ser. No. 512,706

Claims priority, application Japan, Jul. 15, 1982, 57-106401[U]; Jul. 17, 1982, 57-108318[U]

Int. Cl.⁴ F16G *13/00*

U.S. Cl. 59—82 **6 Claims**



1. A link for a watch band and bracelet, comprising:

a plurality of link elements each having a substantially S-shaped configuration and including a face arm facing a face of said link and having a hook provided at the end portion thereof, a back arm facing a back of said link and having a hook provided at the end portion thereof and an intermediate connection portion provided between said face and back arms, wherein said link elements are joined together at said intermediate connecting portions of respective link elements with at least one of said link elements being disposed in a direction opposite to that of the other elements, and wherein said hooks of said face and back arms of said link elements are respectively engaged to hooks of back and face arms of adjacent link elements which are included in adjacent links and are longitudinally aligned in line with said link elements of said link for connecting said link and said adjacent links.

4,554,784

EMERGENCY POWER UNIT AND METHOD

Francis K. Weigand, Torrance, and William H. Nickel, Rancho Palos Verdes, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 17, 1983, Ser. No. 524,048

Int. Cl.⁴ F02C *3/20*; F01N *3/15*

U.S. Cl. 60—39.02 **14 Claims**

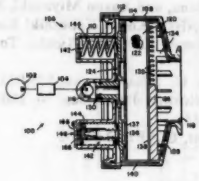
4. A method of generating a controlled, emergency flow of motive gas, comprising:

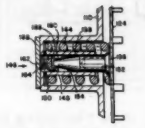
producing a pressurized, liquid feed flow;

reacting said feed flow with a confined bed of granular catalyst material to generate said emergency flow of motive gas, said feed flow tending to induce vibration of said bed of granular material; and

spring loading a container holding the bed in a confined space in one direction toward a fixed support, the spring loading tending to enhance vibration of said bed;

inhibiting vibration of said bed induced by said feed flow by securing said container against motion in a direction opposing said one direction without impairing said spring loading in said one direction; and





automatically compensating for movement of said container in said one direction to continue prevention of motion of said container in said opposing direction.

4,554,785

ENGINE EXHAUST APPARATUS

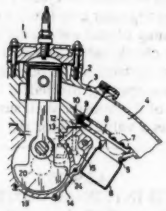
Ikuo Oike, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,426

Claims priority, application Japan, Dec. 24, 1982, 57-225925; Dec. 24, 1982, 57-195158[U]

Int. Cl.⁴ F02B *27/02*

U.S. Cl. 60—314 **2 Claims**



1. Exhaust apparatus for a vehicle engine, comprising a sub-chamber connected by a connecting line to an engine exhaust line, said connecting line being located part way along said exhaust line and having thereon an opening and closing valve connected to a motive power source which is responsive to the number of revolutions of said engine and which causes said valve to open and close in correspondence with the number of said revolutions, wherein said motive power source is connected to a shaft mounting said valve by elements inserted through the outer walls of a cylinder of said engine, said exhaust line, and a crank case.

4,554,786

VACUUM SOURCE DEVICE FOR VACUUM BOOSTER FOR VEHICLES

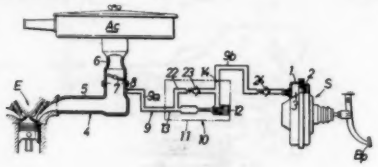
Hiroo Takeuchi, Asashina, and Kazuo Miyazaki, Shiki, both of Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Nagano and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sep. 16, 1983, Ser. No. 533,023

Claims priority, application Japan, Sep. 16, 1982, 57-161370; Jul. 28, 1983, 58-138443

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—397 **9 Claims**



1. A vacuum source device including dual check valves in combination with an intake system for a vacuum booster for vehicles said vacuum booster including a shell defining a vacuum chamber, said vacuum source device comprising:

(a) an air ejector including a body having a front surface, a rear surface and a side surface;

(b) an air inlet at the front surface of said body with an air inlet communicating with the atmosphere;

(c) an air outlet on the rear surface to lead to an opposed vacuum pick up port opening to the portion of the engine intake system downstream of a throttle valve;

(d) a suction port formed on the side surface and communicating with the vacuum chamber of the vacuum booster;

(e) a pressure reduction chamber communicating with said air inlet and also communicating with said suction port via a passage and an outlet chamber communicating with said air outlet;

(f) a diffuser connecting between said reduction chamber and said outlet chamber;

(g) a by-pass formed in said body for connecting between said outlet chamber and said suction port while detouring said diffuser of the air ejector;

(h) a first check valve disposed in said by-pass passage;

(i) a second check valve disposed in a valve chamber formed at a juncture between said suction port and said by-pass passage, and being in series flow relationship with said first check valve whereby said air ejector and said first and second check valves together constitute a unit, said suction port serves as an opening of said valve chamber for accommodating said second check valve and said unit is integrally attached to a front surface of the booster shell such that said opening meets an opening formed in the booster shell and that the portion of the booster shell surrounding the booster opening serves as a valve seat for the second check valve.

4,554,787

SUPERCHARGED INTERNAL COMBUSTION ENGINE

Camille Wilhelm, 8, rue du Ruisseau Bleu, 67100 Strasbourg-Neudorf; Camille Wilhelm, 107, rue des Pres, 67380 Lingolsheim, and Robert Wilhelm, 7, rue de Rangen, 67200 Strasbourg-Cronenbourg, all of France

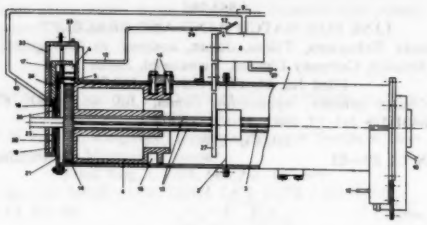
Filed Jun. 3, 1982, Ser. No. 384,658

Claims priority, application France, Jun. 3, 1981, 81 11121; Nov. 23, 1981, 81 22013

Int. Cl.⁴ F02B *37/00*

U.S. Cl. 60—605 **8 Claims**

1. A supercharged internal combustion engine comprising a cylinder formed of two identical portions assembled together symmetrically about an axis perpendicular to the longitudinal axis of said cylinder portions, an engine shaft extending along said axis, two reciprocating rotating pistons in the cylinder on the engine shaft and slidably but non-rotatably mounted on the engine shaft, an explosion chamber disposed at each end of the cylinder and communicating with the cylinder, carburetor means for injecting a combustible mixture into each explosion



chamber, a turbo-compressor driven by the engine shaft and having air outlets connected to air inlets at each end of the cylinder, and means responsive to explosions in the explosion chamber to rotate the pistons in said cylinder thereby to rotate said engine shaft.

4,554,788

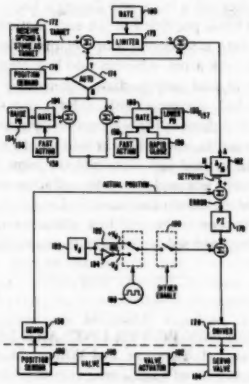
TURBINE VALVE CONTROL SYSTEM

Eddie Y. Hwang, Winter Park, Fla.; Andras I. Szabo, Murrysville, Pa., and Wu-shi Shung, South Windsor, Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 564,062

Int. Cl.⁴ F01K *13/00*

U.S. Cl. 60—646 **17 Claims**



7. An improved steam inlet valve control system for a steam turbine, comprising

(A) control means including a controller for providing a control signal to govern the opening and closing of said valve;

(B) means for providing a valve opening setpoint signal;

(C) sensing means operable to provide a position signal indicative of the actual position of said valve;

(D) said control means being operable to provide said control signal as a function of the difference between said setpoint signal and said position signal; and

(E) means for superimposing an oscillatory signal on said control signal if said difference exceeds a first predetermined value.

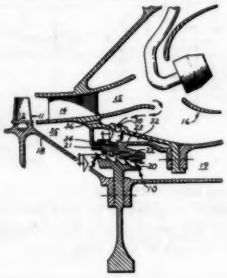
4,554,789
SEAL COOLING APPARATUS

Phillip D. Napoli, Westchester, and William R. Patterson, Maineville, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 224,877, Jan. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 15,578, Feb. 26, 1979, abandoned. This application Apr. 2, 1984, Ser. No. 594,956

Int. Cl.⁴ F01D *25/12, 11/04*

U.S. Cl. 60—751 **4 Claims**



1. An improved gas turbine engine comprising a compressor, a compressor diffuser, and a combustor all in serial flow relation, a pressure seal downstream of said compressor and a cavity forward of said seal in flow communication with compressor discharge air and radially surrounding a portion of a compressor rotor, said cavity being located upstream of an outlet to said compressor diffuser, said pressure seal including an outer stator, wherein the improvement comprises:

means for deriving conditioning air from air discharged from the compressor diffuser and directing said conditioning air onto said stator to improve the thermal response of said stator; and

means to inject a substantially constant portion of said conditioning air into said cavity to purge the region and prevent zero airflow conditions during engine operation for the purpose of discouraging overheating of a portion of the compressor rotor;

wherein a portion of said conditioning air from said cavity is directed to flow through and thereby cool said seal.

4,554,790
MAGNETIC REFRIGERATING APPARATUS

Hideki Nakagome, Yokohama, and Satoshi Yasuda, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 13, 1985, Ser. No. 701,303

Claims priority, application Japan, Feb. 13, 1984, 59-22769

Int. Cl.⁴ F25B *21/02*

U.S. Cl. 62—3 **10 Claims**

1. A magnetic refrigerating apparatus comprising:

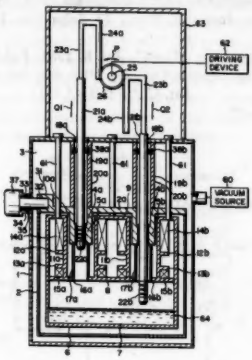
magnetic field generating means for generating a magnetic field;

holding means for holding an object to be cooled;

a heat absorber including a working substance adapted to generate heat when located inside the magnetic field generated by the magnetic field generating means and to absorb heat when located outside the magnetic field; and

driving means for alternately transferring the heat absorber between a first position where the heat absorber is located inside the magnetic field and a second position where the heat absorber is located outside the magnetic field, whereby the object to be cooled is cooled by the heat absorber when the heat absorber is in the second position, the improvement in which

said heat absorber includes a plurality of working substance pieces arranged at regular intervals along the direction of transfer thereof, and a plurality of adiabatic spacers each



interposed between adjacent pieces to prevent direct contact between the pieces.

4,554,791
APPARATUS FOR CONVEYING LIQUIDS

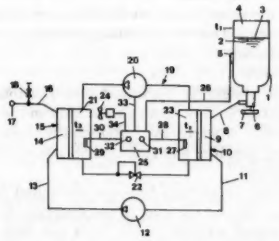
Gustav A. Johansson, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Dec. 30, 1983, Ser. No. 567,416

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300297

Int. Cl.⁴ F17C *13/00*

U.S. Cl. 62—55 **11 Claims**



1. Apparatus for conveying liquids of which the vapour pressure is above atmospheric at ambient temperature from a storage container to a delivery point, comprising, a storage container, pumping means, fluid conduit means between said storage container and said pumping means having a heat exchange section, said heat exchange section including cooling passage means for receiving a cooling medium, cooling apparatus for supplying a cooling medium to said cooling passage means, temperature sensor means for sensing temperatures of said storage container and said cooling passage means of said heat exchange section, and temperature regulating apparatus responsive to said temperature sensor means for operating said cooling apparatus to maintain the temperature of fluid in said cooling passage means of said heat exchange section a predetermined amount cooler than said storage container.

4,554,792

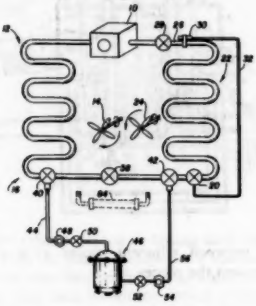
METHOD AND APPARATUS FOR REHABILITATING REFRIGERANT

Allen L. Margulefsky, 1038 Peninsula Blvd., Woodmere, N.Y. 11598, and James F. Lutz, 13 John La., Levittown, N.Y. 11756

Division of Ser. No. 271,447, Jul. 8, 1981, Pat. No. 4,480,446. This application Oct. 29, 1984, Ser. No. 665,861

Int. Cl.[4] F25B *45/00*

U.S. Cl. 62—77 **8 Claims**



1. A method of reconditioning contaminated refrigerant in a refrigeration system of the type having an evaporator, a condensor, and a compressor, the method comprising the steps of:

connecting a first valve in the refrigerant liquid line at the outlet of the condensor;

connecting a filter and tank assembly to the first valve;

causing the contaminated refrigerant to flow into the filter and tank assembly;

retaining the refrigerant in the filter and tank assembly;

interrupting the refrigerant liquid line connecting the condensor coil and the evaporator coil;

performing all necessary repairs and replacements in the refrigeration system;

connecting a second valve in the refrigerant liquid line at the inlet to the evaporator;

connecting the second valve to the filter and tank assembly;

opening the second valve and causing the refrigerant to flow into the system;

opening the first valve;

operating the system for a selected period of time to cause the refrigerant to flow through the filter in the filter tank and assembly, whereby the refrigerant is cleaned;

disconnecting the filter and tank assembly from the first and second valves;

making a fluid connection between the outlet line of the condensor coil and the inlet of the evaporator; and

forming a partial vacuum in the filter and tank assembly prior to connecting it to the output line of the condensor coil.

4,554,793

CONTROLLED POWER CONVERTER FOR THERMOELECTRIC HEAT PUMP DRIVE

John C. Harding, Jr., Framingham, Mass., assignor to General Eastern Instruments Corporation, Watertown, Mass.

Filed Jun. 9, 1983, Ser. No. 502,475

Int. Cl.[4] G10N *31/00*

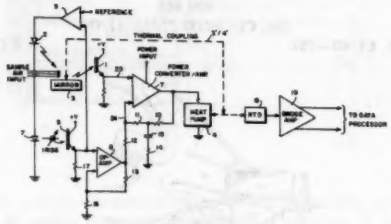
U.S. Cl. 62—126 **15 Claims**

1. A controlled power conversion system for providing power to a thermoelectric heat pump for controlling the temperature of a device, said power conversion system comprising

means for supplying DC input power;

means responsive to the temperature of said device for providing a control signal representative of changes in the temperature thereof;

pulse width modulation/switching means responsive to said DC input power and to said control signal for providing periodic pulses of said DC input power having a duty cycle controllable in accordance with said control signal;



means for providing time averaging of said input power; and

energy storage means responsive to said periodic pulses of DC input power for providing a controllable time averaged DC power output to said heat pump.

4,554,794

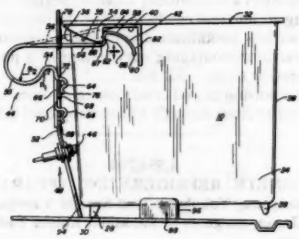
CONDENSATE RECEPTACLE SUPPORT FOR DEHUMIDIFIER

Aman U. Khan, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 20, 1984, Ser. No. 622,867

Int. Cl.[4] F25D *21/00*

U.S. Cl. 62—150 **16 Claims**



1. An improved support for a condensate accumulating receptacle associated with an apparatus that discharges a liquid during operation and has a shut-off switch to interrupt its operation, said receptacle having a top portion and an opening for admitting condensate from the apparatus, said support comprising:

pivot means associated with the receptacle for guiding pivoting movement of said receptacle relative to said apparatus; and

spring clip means on said apparatus engaging said receptacle top portion to at least partially support said receptacle and simultaneously provide controlled resistance to said pivoting movement,

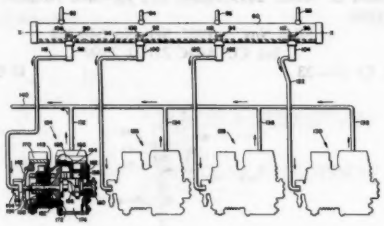
said receptacle pivoting in response to a buildup of condensate in said receptacle and upon pivoting a predetermined amount with said condensate at a desired level causing said shut-off switch to interrupt operation of said apparatus.

4,554,795

COMPRESSOR OIL RETURN SYSTEM FOR REFRIGERATION APPARATUS AND METHOD

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Filed Nov. 14, 1983, Ser. No. 551,430
Int. Cl.[4] F25B *43/02*
U.S. Cl. 62—175 18 Claims



1. In a refrigeration system having multiple compressors for compressing a refrigerant fluid, an oil return system for conveying oil entrained in circulating refrigerant fluid back to the compressors, comprising

a suction manifold common to the compressors, in which the entrained oil is trapped;

suction lines connecting a suction port on each compressor in fluid communication with the common suction manifold; and

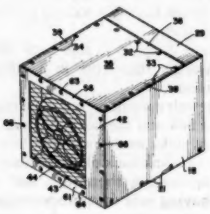
a plurality of oil pick-up means for drawing oil trapped in the common suction manifold into the suction line connected to any compressor that is in use and thereby operative to return the trapped oil to an operating compressor in the refrigeration system, while avoiding oil return to an inactive compressor.

4,554,796

SPLIT SYSTEM AIR CONDITIONER

James M. Stankard, Mentor, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 456,819, Jan. 10, 1983, abandoned. This application Aug. 14, 1984, Ser. No. 640,544
Int. Cl.[4] F25B *27/66*
U.S. Cl. 62—326 6 Claims



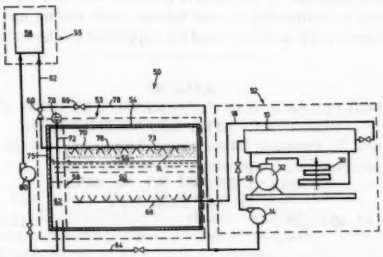
1. A convertible housing for a refrigeration compressor and condenser unit having a compressor, condenser, a motor driven fan, and a fan associated venturi member, said housing comprising a rectangular base, a pair of vertically extending parallel sidewalls extending upwardly from one pair of opposite sides of said base to the top of said unit and defining opposed vertical end wall positions therebetween, the compressor being mounted on said base, the condenser being mounted at one of said end wall positions, a top panel mounted on top of said sidewalls adjacent said condenser and extending a predetermined distance from said condenser toward the other of said end wall positions, an imperforate closure panel, and a fan panel assembly including the venturi member and the motor-driven fan both secured to the fan panel assembly, said closure panel and said fan panel assembly being interchangeably mounted on said sidewalls by removable fasteners in either of two positions, a first of said positions being horizontal on top of said sidewalls and parallel to said base, the second of said positions being the other of said end wall positions, said condenser and compressor unit having fixed exterior dimensions regardless of the relative positions of said interchangeable closure panel and fan panel assembly, said rectangular base always being the lowermost portion of said housing when the housing is in an installed, operating, position.

4,554,797

THERMAL STORAGE HEAT EXCHANGER SYSTEMS OF HEAT PUMPS

Vladimir Goldstein, 18 Killaloe Rd., Unit 4, Concord, Ontario, Canada (L4K 1C8)

Continuation-in-part of Ser. No. 459,747, Jan. 21, 1983, Pat. No. 4,480,445. This application Oct. 1, 1984, Ser. No. 656,246
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—434 11 Claims



1. In a heat pump having a heat source, a heat sink and a thermal storage heat exchanger in which heat energy is cyclically accumulated and discharged by circulation of a secondary refrigerant therethrough, the improvement wherein:

(i) the secondary refrigerant is an aqueous soluation having a concentration which is below its eutetic concentration,

(ii) the heat sink is adapted to cool or super-cool the aqueous solution to generate cooled secondary refrigerant, which, when cooled is a liquid and when super-cooled, is partially frozen and contains fine ice particles in suspension,

(iii) the thermal storage heat exchanger has a storage chamber,

(iv) a first input communicating between said storage chamber and the heat sink for admitting said cooled secondary refrigerant, such that when super-cooled secondary refrigerant is admitted the ice particles will separate from the liquid phase refrigerant to form a porous ice bed and a substantially ice free liquid bath, and when the cooled liquid is admitted it will be directed into intimate contact with the ice bed in a manner such that it may pass through the pores of the porous ice bed prior to its return to the bath,

(v) a first output communicating with said storage chamber for discharging liquid phase refrigerant from said storage chamber for circulation to said heat sink and/or said heat source.

4,554,798

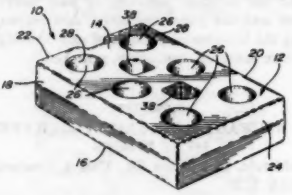
BOTTLE COOLING DEVICE

Richard D'Amour, 1625 des Merisiers, Côte Ste. Catherine, Quebec, Canada (J0L 1E0), and Ronald D'Amour, 5 Belanger, St. Constant Quebec, Canada (J0L 1X0)

Filed Feb. 14, 1984, Ser. No. 580,010
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 19 Claims

1. A device for cooling a plurality of liquid-filled bottles, comprising a container made of a rigid pressure-expandable plastic material and having therein a refrigerant material, said

container having top and bottom surfaces and being formed with a plurality of through-holes which extend between said top and bottom surfaces and are each associated with a respective one of said bottles to be cooled, each said through-hole adapted to receive the neck of its associated bottle therein and having an inner peripheral wall with at least a surface portion



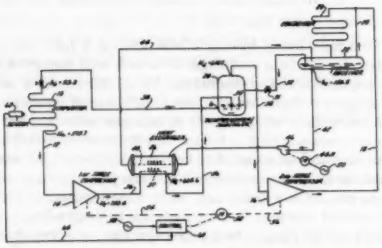
thereof adapted to rest on and in contact with an upper portion of said associated bottle for the cooling thereof, and said container being dimensioned to fit in a receptacle containing said bottles disposed in an upright position, whereby to be positioned in relationship to said bottles while resting upon only the upper portion thereof and not supported by the receptacle.

4,554,799

MULTI-STAGE GAS COMPRESSOR SYSTEM AND DESUPERHEATER MEANS THEREFOR

Francis T. Pallanch, Minneapolis, Minn., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Oct. 29, 1984, Ser. No. 665,565
Int. Cl.[4] F25B *1/10*
U.S. Cl. 62—509 **10 Claims**



7. A refrigeration system comprising:

a first compressor stage;

an evaporator which feeds uncompressed vapor to said first compressor stage;

a condenser;

a second compressor stage which receives compressed vapor from said first stage and feeds liquid to said condenser;

a receiver which receives liquid from said condenser and ultimately feeds it to said evaporator;

and desuperheater apparatus comprising a pressure vessel and a heat exchanger to remove heat from said compressed vapor fed by said first stage to said second stage to thereby improve thermal efficiency of said system and to reduce the mass of refrigerant to be handled by said second stage;

said pressure vessel containing a bath of liquid which is supplied from said receiver and then fed to said evaporator and through which compressed vapor from said first stage is forced and cooled before being fed to said second stage along with vapor from said bath of liquid;

said heat exchanger having one side through which said compressed vapor from said first stage passes and is cooled on its way to said pressure vessel;

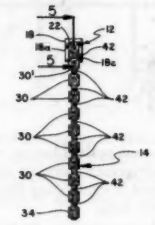
said heat exchanger having another side through which liquid is fed from said receiver and then returned to said receiver as a liquid/vapor mixture.

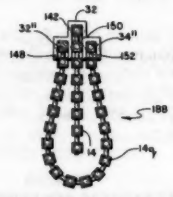
4,554,800

JEWELRY ARRANGEMENT

Richard D. Moon, 2419 Fallen Dr., Rowland Heights, Calif. 91748

Filed Nov. 3, 1983, Ser. No. 548,353
Int. Cl.[4] A44C *25/00, 7/00*
U.S. Cl. 63—23 **13 Claims**





1. An improved jewelry arrangement, comprising, in combination:

a base means;

said base means having a back plate means having a first predetermined geometric configuration, and a side wall means comprising a plurality of side wall portions upstanding from said back plate means, and defining a generally "U" shape having an opening at one end thereof, and said side wall means having a second predetermined geometric configuration;

ear attaching means coupled to said back plate means and extending outwardly therefrom in a direction opposite said side wall means;

a first chain-like jewelry member, having a plurality of links, at least one end link and the next adjacent link thereto of said plurality of links each having a box-like structure means comprising a link back plate member and a link side wall member upstanding therefrom, and said link back plate member having said first predetermined geometric configuration, and said link side wall member having said second predetermined goemetric configuration;

said at least one end link coupled to said base means, and said link back plate of said one end link being adjacent said back plate means, and said link side wall of said one end link being adjacent said side wall means;

said chain-like jewelry member extending through said opening of said "U" shaped side wall means;

said back plate means of said bse means being adjacent at least a portion of said link back plate of said next adjacent link, and said side wall means of said base means being adjacent at least a portion of said link side wall of said next adjacent link;

and adhesive means for coupling said box-like structure means of said at least one end link to said base means, and

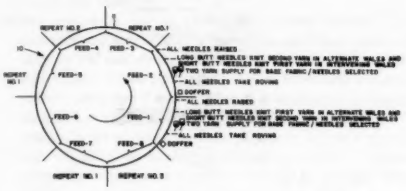
at least a portion of said box-like structure means of said next adjacent link to said base means.

4,554,801

PILE FABRIC METHOD AND APPARATUS

Thomas J. Thore, Tarboro, N.C., assignor to Glenoit Mills, Inc., Tarboro, N.C.

Filed Aug. 13, 1982, Ser. No. 407,935
Int. Cl.[4] D04B 9/14
U.S. Cl. 66—9 B **8 Claims**



1. The method of knitting sliver high pile fabric on a circular knitting machine having a plurality of feed stations, a circle of independent selectively positionable needles and sinkers, and sliver and yarn feeds at each feed station, said circle of needles being made up of long butt needles alternating with short butt needles, comprising the steps of:

(a) providing at each feed station a sliver feeding device adapted to deliver an individual roving of sliver fibers to the needle circle to be taken by all the needles rotating past such device;

(b) providing a first and second yarn feed at each feed station, each yarn feed being adapted to feed a separate yarn to the needles after having said fibers taken thereon and being spaced from the other yarn feed; and

(c) positioning said needles at each feed station such that all needles take said roving fibers and thereafter in the direction of rotation of the needles, said needles are selected and said sinkers positioned such that in a repetitive knitting cycle:

(i) at each of selected feed stations long butt needles knit the first yarn in alternate wales with such first yarn being floated in intervening wales whereas the short butt needles knit the second yarn in intervening wales with such second yarn being floated in alternate wales;

(ii) at each of other selected feed stations long butt needles knit the second yarn in the said alternate wales with such second yarn being floated in the said intervening wales and short butt needles knit the first yarn in the said intervening wales with such first yarn being floated in said alternate wales; and

(iii) said sliver fibers are caught in each float stitch intersection in said fabric.

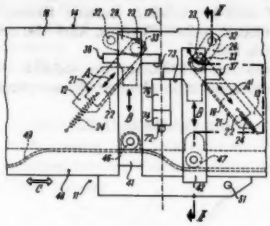
4,554,802

ADJUSTMENT OF STITCH CAMS IN A KNITTING MACHINE

Ernst Goller, Reutlingen; Jürgen Ploppa, Pfullingen, and Fritz Walker, Kusterdingen, all of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Company, Fed. Rep. of Germany

Filed Mar. 13, 1984, Ser. No. 589,247
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310671
Int. Cl.[4] D04B 7/00, 15/36
U.S. Cl. 66—71 **19 Claims**

1. In a knitting machine having a carriage movable along a needle bed through successive strokes, a pair of stitch cams adjustably supported by said carriage to trail behind a needle cam, mounted on said carriage, during alternate ones of said carriage strokes, respectively, and an adjusting mechanism including a stepping motor operative to adjust each of said stitch cams relative to said carriage at a beginning of the respective carriage stroke, the improvement comprising said



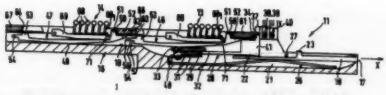
adjusting mechanism including said stepping motor also being operative during the stroke of said carriage to adjust the trailing one of said stitch cams.

4,554,803

FLAT-BED KNITTING MACHINE HAVING ELECTRO-MECHANICAL SELECTION

Hermann Schmodde, Albstadt, and Hans-Günter Haltenhof, Pfullingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Feb. 19, 1985, Ser. No. 702,757
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406870
Int. Cl.[4] D04B 15/66
U.S. Cl. 66—75.2 **35 Claims**



1. A flat-bed knitting machine, comprising:

a plurality of needle beds in each of which longitudinally extending needle tricks are formed;

cam track means operatively associated with the needle beds;

an intermediate plate located in each needle bed and situated to move longitudinally in the needle track to control the longitudinal movement of the needle associated with the respective needle bed;

a first and second selector plate located in each needle bed; and

an electro-magnetic selecting devide operatively associated with the selector plates, wherein:

the electro-magnetic selecting device controls the location of the selector plates, as a function of the knit pattern, relative to the cam track means and their associated intermediate plate; and

the longitudinal movement of the intermediate plates extend from a nominal or first operating position immediately to one of at least three further operating positions as a function of the location of the associated selector plates.

4,554,804

APPARATUS AND METHOD FOR THE PRODUCTION OF TEXTILE SURFACE CONFIGURATIONS

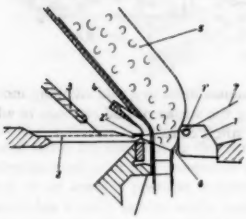
Siegfrid Ploch; Sonja Rössler; Peter Zeisberg, and Horst Heilmann, all of Karl-Marx-Stadt, German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

Filed Jan. 5, 1983, Ser. No. 455,691

Claims priority, application German Democratic Rep., Jan. 25, 1982, 236926

Int. Cl.[4] D04B *27/02*

U.S. Cl. 66—214 12 Claims



1. An apparatus for producing textile surface configurations of both fleece fiber and thread, by forming stitches composed of both fiber and thread, comprising a movable guiding element, said guiding element having a contact edge on its side facing said fleece fiber, and having at least one guiding hole or eyelet for guiding said thread, together with an opposed sliding needle for forming said stitches, said sliding needle having a terminal hook portion, and means to alternately extend said sliding needle transversely through said fleece fiber in opposite directions, so that said hook portion initially engages said thread at said guiding hole or eyelet, and then, when withdrawn to the opposite side of said fleece fiber, engages and pulls both the grasped thread and grasped fibers, so as to form a combined stitch deposited as a long stitch on the side of said fleece fiber opposite to said guiding element.

4,554,805

AGITATING TYPE WASHING MACHINE

Hiroshi Hirooka, Tokyo; Yoshio Yoshida, Ayase; Toshio Fukushi, Hiratsuka; Yasuo Takeya, Yokohama, and Satoshi Nagai, Fujisawa, all of Japan, assignors to Kaisha, Kentetsuco., Ltd., Tokyo, Japan

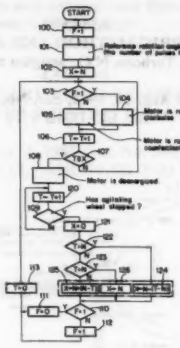
Filed Feb. 17, 1984, Ser. No. 581,155

Claims priority, application Japan, Feb. 21, 1983, 58-27458; Feb. 21, 1983, 58-27459

Int. Cl.[4] D06F *17/08, 33/02*

U.S. Cl. 68—12 R 4 Claims

1. An agitating type washing machine in which a washing drive motor is run in opposite directions to rotate an agitating wheel within a washing tank alternatively in one and the other directions to perform intended washing, comprising rotational angle detecting means for detecting an angle of rotation of said agitating wheel, and control means for controlling said motor in response to a detection signal from said rotational angle detecting means so that the angle of rotation of said agitating wheel by energization of said motor during running under a load is made smaller than the angle of rotation during no load running and so that changing over between running under a load and no load running is automatically effected in response to a detection signal from said rotational angle detecting means, said control means further controlling rotation of said agitating wheel to an angle equal to or less than 360 degrees



including rotation by energization of said motor and rotation by inertia whether during running under a load or no load.

4,554,806

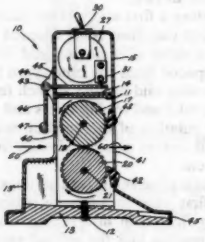
MOTOR DRIVEN MINI-WRINGER

Doris J. Hewins, 835 Oak Hills Dr., Monument, Colo. 80132

Filed Feb. 16, 1984, Ser. No. 580,738

Int. Cl.[4] D06F *45/02, 45/24, 45/26*

U.S. Cl. 68—257 1 Claim



1. A motor driven wringer unit for use in combination with a kitchen counter and sink or the like comprising:

a frame;

a first roller rotatably attached to said frame;

a second roller operably rotatably attached to said frame;

means attached to said frame and to said second roller for biasing said roller towards and against said first roller;

said first and second rollers having serrated surfaces on the exterior thereof;

motor means operably connected to said first roller for selectively rotating said first roller, whereby rotation of said first roller will squeeze liquid out of a wet cloth or the like disposed between said rollers;

liquid catching means attached to said frame below said first and second rollers for catching liquids which have been forced out of a wet cloth or the like;

spout means connected to said liquid catching means for directing the flow of liquids from said liquid catching means into a sink or the like;

a housing attached to said frame, said housing including an inlet opening on one side thereof adjacent to the place where the first and second rollers touch each other; and an exit opening on the other side of the housing adjacent to the place where the first and second rollers touch each other whereby a wet cloth or the like may be placed in the inlet opening, and will be automatically squeezed through

and between the rollers and out through the exit opening of the housing, said housing enclosing said first and second rollers, said biasing means and said motor means;

base means connected to said frame for permitting said wringer unit to be set on a counter adjacent to a sink wherein the spout means will direct liquids into the sink, said base means being rigidly connected to the frame and rigidly connected to the housing, said spout means being formed in the top of said base means and extending to an outlet opening in the housing whereby liquids flowing from said spout means will flow through said outlet opening in the housing;

safety means having an abutment portion thereof disposed towards the top of and adjacent to said inlet opening for turning off said motor means and thereby the rotation of said rollers when said safety means is pushed toward said rollers whereby if a user's hand is in danger of becoming caught between said rollers, said safety means will automatically be actuated to turn off the motor and permit the user's hand to be retracted, said safety means comprising a normally closed micro-switch having an actuator thereon which opens the circuit to said motor means when said actuator is depressed, said safety means further comprising an L-shaped member pivotally attached to said housing and having one leg thereof adjacent to the micro-switch actuator whereby when said abutment portion thereof is pushed toward said rollers, said one leg of the L-shaped portion depresses said micro-switch actuator;

on/off switch means connected in the circuit to control said motor means and attached to said housing for selectively turning the motor means on or off; and

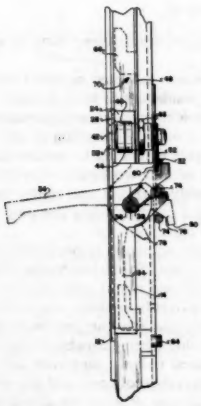
means disposed on housing adjacent to the bottom part of said exit opening having a downwardly sloping surface thereon for guiding a cloth or sponge out of said exit opening to prevent it from catching on the housing surface which forms said exit opening.

4,554,807

DOOR LATCH MECHANISM

Anthony H. Dolejs, Bedford Heights, Ohio, assignor to ARDAC, Inc., Eastlake, Ohio

Filed Oct. 12, 1983, Ser. No. 541,113
Int. Cl.[4] B60R *25/02*
U.S. Cl. 70—208 **11 Claims**



1. A latch assembly, comprising:

a latch housing;

a handle received within a recess within said latch housing, said handle being pivotal about the axis;

a spring in engagement with said handle and urging said handling from said recess;

means for engaging said handle and maintaining said handle within said recess at a position whereat said handle is entirely recessed with respect to a front surface of said latch housing,

said means comprising a slot within said latch housing, securing means adapted for selective positioning in said slot; and

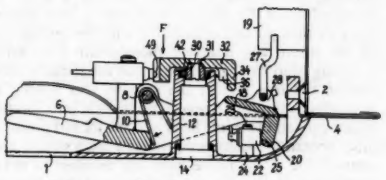
a lock cylinder housing connected to and extending from said latch housing, said lock cylinder housing having a cavity therein between first and second flanges for receiving a lock cylinder.

4,554,808

EXTERIOR CONTROL FOR A VEHICLE DOOR PROVIDED WITH AN ELECTRIC LATCH

Gérard Escaravage, Valentigney, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Jul. 13, 1983, Ser. No. 513,494
Claims priority, application France, Jul. 29, 1982, 82 13276
Int. Cl.[4] E05B *47/00*
U.S. Cl. 70—279 **6 Claims**



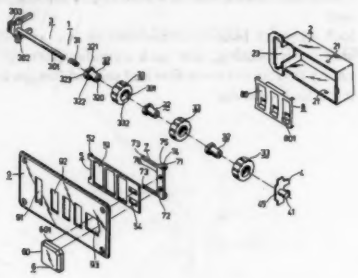
1. An exterior control structure in combination with a vehicle door, a latch for the door, electric shifting means combined with the latch for selectively opening and closing the latch, an electric circuit including switching means for electrically controlling the electric shifting means, a linkage for mechanically opening the latch in the event of breakdown of said electric circuit or electric shifting means, said control structure comprising an actuating element mounted on the door to be movable between a first position and a second position, means for resiliently returning the actuating element to said first position for closing the latch, and a rotatable barrel actuatable by a key and having an inner end, means for locking and preventing operation of the latch and cooperative with said inner end of the barrel, the actuating element having an end which defines a lug cooperative with said switching means of the electric circuit for controlling said electric shifting means for the latch and a heel cooperative with the linkage, the means for locking the latch comprising a locking cam which is fixed to the barrel and carries an abutment cooperative with the heel of the actuating element, said abutment being movable with said cam by said key between a first position in which the abutment lies in a path of movement of the heel and thereby prevents the actuating element from moving to said second position of the actuating element and a second position in which the abutment is clear of said path of movement and allows the actuating element to move to said second position of the actuating element and open the latch by means of said linkage.

4,554,809

COMBINATION LOCKING DEVICE FOR SUITCASES

Yaw Kuen Yang, 190-30 Chang Shiu Rd., Chang-Hua City, Taiwan

Filed Oct. 11, 1983, Ser. No. 540,507
Int. Cl.⁴ E05B *37/02*
U.S. Cl. 70—312 **12 Claims**



1. A combination locking device comprising:
a housing body;
code latch means mounted within the housing body, the code latch means comprising: a frame head movable between a locked and an unlocked position; a spindle connected to and extending from the frame head; sleeves rotatively mounted on the spindle, each sleeve having a shank, an annular protrusion on the shank with a dent portion thereon, and a toothed portion; a wheel axially mounted about the shank of each sleeve, each wheel having a toothed portion engageable with the toothed portion of the sleeve and numbers thereon for code setting; a coupling head having a hollow stub for slidably receiving therein the free end of the spindle; and biasing means normally urging the sleeves and wheels into toothed engagement and the frame head into the locked position; and
manual operating means comprising: a latch sliding member connectable to the frame head and adapted to move the frame head against the action of the biasing means into the unlocked position; coupling means for disengaging the toothed portions of each sleeve and its corresponding wheel respectively so that the wheels can freely rotate about the shank of the sleeve to permit changing of the code setting; and push block means connected to both the latch sliding member and the coupling means so that each can be independently operated by the push block means.

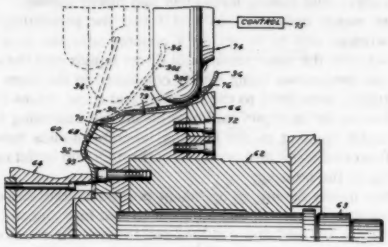
4,554,810

DRAW-SPINNING OF INTEGRAL VEHICLE WHEEL RIM AND DISC SEGMENTS

Kevin D. Jurus, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Apr. 2, 1984, Ser. No. 596,143
Int. Cl.⁴ B21D *22/16*
U.S. Cl. 72—70 **9 Claims**

1. A method of forming an annular article of preselected cross sectional geometry and thickness contours from a circular blank of greater thickness than said preselected thickness contour comprising the steps of
(a) clamping the central portion of said blank in a spinning chuck having a convex mandrel surface which corresponds to said preselected geometry contour, such that the peripheral portion of said blank is spaced from said surface,
(b) draw spinning said peripheral blank portion by engaging said peripheral portion with a draw spinning roller while said peripheral portion remains spaced from and unsupported by said mandrel surface so as to obtain controlled thickness reduction in said unsupported peripheral blank portion to said preselected cross sectional thickness contour, and then



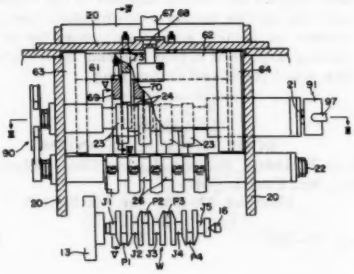
(c) spin-forming said peripheral portion against said surface with a second roller without substantially altering the thickness contour thereof so as to obtain said preselected geometry contour.

4,554,811

CRANKPIN ROLLING APPARATUS

Takehiko Hayashi, Toyota; Hiroyuki Ikuta, Nagoya, and Takanori Ohta, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 4, 1983, Ser. No. 520,341
Int. Cl.⁴ B21H *7/00*
U.S. Cl. 72—110 **7 Claims**



1. A crankpin rolling apparatus comprising in combination:
a frame;
workpiece support means mounted on said frame for rotatably supporting a crankshaft to be processed;
plural pairs of arms spaced at the same intervals as crankpins of said crankshaft in an axial direction of said crankshaft;
a plurality of hinge pins extending in parallel relation with the rotational axis of said workpiece support means and respectively pivotably carrying said plural pairs of arms each for permitting a corresponding one pair of said arms to effect open and close motions;
a plurality of pressuring actuators respectively connected to said plural pairs of arms for independently effecting open and close motions of said plural pairs of arms;
a pair of roller holders fixedly mounted respectively on each pair of said arms and rotatably carrying burnishing rollers, said pair of roller holders being capable of engaging one of said crankpins aligned radially therewith and pressuring said burnishing rollers thereof upon said one of said crankpins when said each pair of arms are closed by a corresponding one of said pressuring actuators;
an arm support mechanism mounted on said frame for independently supporting each of said hinge pins for movement toward and away from the rotational axis of said workpiece support means so that said pair of roller holders

engaging a corresponding one of said crankpins are rotated together with said corresponding one of said crankpins when said crankshaft is rotated, said arm support mechanism comprising a support shaft carried on said frame in parallel relation with the rotational axis of said workpiece support means, and

a plurality of rocking members pivotably carried on said support shaft and respectively supporting said hinge pins for permitting the same to move independently in a direction toward and away from the rotational axis of said workpiece support means;

drive means for rotating said crankshaft on said workpiece support means about the axis thereof so that said burnishing rollers of said pair of roller holders effect roll finishing upon said corresponding one of said crankpins being engaged by said pair of roller holders;

first position control means mounted on said frame for regulating positions of said hinge pins in a direction toward and away from the rotational axis of said workpiece support means and the pivot positions of said plural pairs of arms about said hinge pins prior to the loading of said crankshaft onto said workpiece support means;

second position control means mounted on said frame and operable selectively with said first position control means for regulating positions of said hinge pins in a direction toward and away from the rotational axis of said workpiece support means and pivot positions of said plural pairs of arms about said hinge pins prior to the loading onto said workpiece support means of another crankshaft which is different from said crankshaft in kind; and

means for selectively disabling at least one of said plural pairs of arms such that said at least one pair of arms does not obstruct loading and unloading of said another crankshaft on said workpiece support means.

4,554,812

HEAT SHIELD FOR A ROLLING MILL

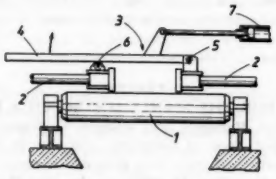
Franz Hirschmanner, Leonding; Rudolf Buchegger, St. Florian, and Franz Brettbacher, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 10, 1984, Ser. No. 639,582

Claims priority, application Austria, Sep. 8, 1983, 3200/83

Int. Cl.⁴ B21B *27/06*

U.S. Cl. 72—202 **8 Claims**



1. In a hot-rolling plant comprising

at least one roller conveyor for transporting stock to be rolled, which roller conveyor has two mutually opposite side edges extending along said roller conveyor and

a pair of side guards, which are disposed on said roller conveyor adjacent to and extend along respective ones of said side edges and are adapted to be moved on said roller conveyor transversely to said side edges and to guide said stock along said roller conveyor,

the improvement residing in

the combination with said side guards of heat-shielding covering means, which are provided over said roller conveyor and are adapted to be opened so as to expose said roller conveyor to inspection from above,

said covering means being supported by said side guards and connected to at least one of said side guards so as to be movable in unison with said one side guard.

4,554,813

LIVE-ROLLER FEED BED FOR CONVEYING INDIVIDUAL LENGTHS OF ROLLED STOCK IN CLOSE SUCCESSION TO COOLING BEDS

Hugo Feldmann, Alsdorf; Theodor Gipperich, Dusseldorf; Hans Kirchhoff, Krefeld, and Rolf Stodt, Kaarst, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 557,838

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 3244766

Int. Cl.⁴ B21B *43/00*

U.S. Cl. 72—251 **11 Claims**

1. In a roller feed bed, for conveying cut lengths of a rolled product along a travel path and to a cooling bed disposed laterally adjacent to one side of the roller feed bed and travel path, including

a conveying roller table for conveying the lengths to the cooling bed and having a fixed longitudinal guide channel, a braking section parallel and laterally adjacent to the guide channel and provided with vertically displaceable braking means for braking the cut lengths, and vertically displaceable separating means between the guide channel and braking section, the braking section having an operative position lower than the guide channel and the cooling bed being laterally adjacent the braking section for receiving the cut lengths therefrom, and switching means disposed upstream of the conveying roller table for directing the cut lengths into selected laterally adjacent paths, the improvement comprising:

a guide trough disposed between the switching means and the roller table having an entry end adjacent the switching means and an exit end adjacent the roller table;

means mounting said guide trough for horizontal pivotal movement transversely to the travel path of the cut lengths about a vertical axis at said exit end;

a first longitudinal section on said guide trough having a fixed base aligned with the guide channel of the roller table;

a second longitudinal section on said guide trough laterally adjacent said first longitudinal section aligned with the braking section and having a vertically movable base so that said second longitudinal section is movable between a lower and a raised operative position lower and higher respectively than said first longitudinal section;

said guide trough in cross-section being laterally inclined downwardly from said first section to said second section towards the side of the travel path of the cut lengths at which the cooling bed is disposed;

drive means operatively connected to said second longitudinal section for moving said second section vertically between said raised and lowered positions;

further drive means operatively connected to said guide trough and switching means for simultaneously moving the entry end of said guide trough and the adjacent end of said switching means laterally transversely to the travel path of the cut lengths to selectively direct by the switching means the cut lengths into said first longitudinal section in a direction diverging obliquely from said second section or in a substantially straight line;

and drive means operatively connected to said switching means for moving said switching means independently of said guide trough for selectively aligning the switching means with said first and second longitudinal sections of said guide trough.

4,554,814

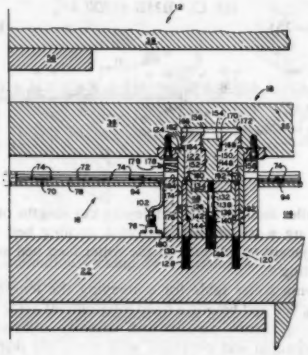
AIR TRANSFER SYSTEM AND METHOD FOR A SHELL PRESS

Arthur L. Grow, Versailles; Charles J. Gregorovich, St. Marys, and Donald N. Seyfried, New Bremen, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Continuation of Ser. No. 434,046, Oct. 13, 1982, abandoned. This application Nov. 1, 1984, Ser. No. 666,144

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—345 **28 Claims**



1. A shell press for making shells for beverage cans and the like, comprising:

a slide assembly including a blanking and forming die station and a curling die station, both of said die stations being operated by said slide assembly, and a pair of reciprocative slide members,

a pair of first tooling members being mounted in said blanking and forming die station for blanking and forming a shell, one of said first tooling members being operably connected to a first slide member in said slide assembly,

first means for reciprocating said first slide member,

a pair of second tooling members being mounted in said curling die station for curling a blanked and formed shell, one of said second tooling members being operably connected to a second slide member in said slide assembly,

second means for reciprocating said second slide member,

means for ejecting a blanked and formed shell from said blanking and forming die station, and

fluid conveyor means extending between said die stations for conveying an ejected shell from said blanking and forming die station to said curling die station, said fluid conveyor means including a pair of opposed side walls defining a track and a hollow tube member, said tube member connected to a source of air located remotely from said track, said tube located in a bottom portion of said track contiguous with and extending substantially the distance between said die stations, said hollow tube member having a diameter much less than the transverse distance between said opposed side walls and further having a plurality of openings therein, said openings being shaped to provide air flow velocity components directed both upwardly and toward said curling die station when a flow of air is supplied therethrough.

4,554,815

TOOL PACK ASSEMBLY

Gale F. Weishalla, Maple Grove, Minn., assignor to Pride Machine, Inc., Fridley, Minn.

Filed Sep. 21, 1983, Ser. No. 533,867

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—349 **9 Claims**

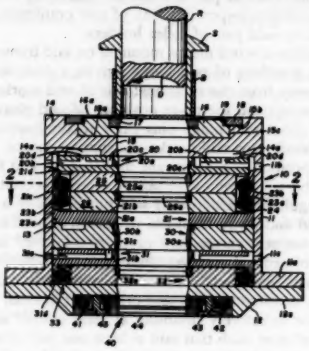
1. A tool pack assembly for use in an ironing press which press is provided with a ram moveable along an axial path of the tool pack assembly to reduce the thickness of the wall of a cup, said tool pack assembly including:

a. a longitudinally extending housing providing a longitudinally extending cavity therein for the housing of the tool pack components;

b. a re-draw die assembly arranged on one end of said housing for initial sizing of a cup blank as the same is driven therethrough by the ram of the press;

c. at least one ironing die assembly arranged in said cavity and of a diameter to permit radial shifting thereof, said die assembly including a circular die support member and an ironing die mounted generally centrally thereof;

d. a plurality of centering means arranged within said cavity



and being spaced arcuately therein about said ironing die assembly, said centering means including a plurality of individually acting longitudinally extending pin members having their longitudinal axis parallel to the axial path of the tool pack assembly and pin biasing members each of which is arranged and constructed to provide a centering force against said ironing die assembly entirely along the longitudinal dimension thereof; and,

e. a stripper die assembly arranged on the other end of said housing permitting the formed container to pass therethrough in one direction and preventing return of the container upon return of the ram through said tool pack assembly whereby the formed container is removed from the ram.

4,554,816

METHOD FOR THE MANUFACTURE OF A PIPE BEND

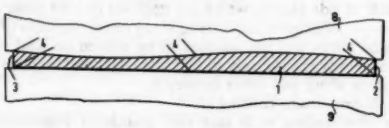
Erich Stender, Ratingen, and Wilhelm G. Fuesers, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft A.G., Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,274

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3127199

Int. Cl.[4] B21C *37/08;* **B21D** *21/00, 5/10;* **B21H** *1/22*

U.S. Cl. 72—368 **2 Claims**



1. A method for the manufacture of a pipe bend from a longitudinally seam welded pipe comprising rolling a slab ingot to form a sheet, bending the resulting sheet to form a butted tube having a longitudinal slit, welding the slit, and bending the pipe about an axis which is substantially perpen-

dicular to a longitudinal plane passing through the axis of the pipe,

characterized in that said slab ingot is rolled in such manner that the thickness of the resulting sheet varies, from one side edge to the other, by first decreasing continuously from the thickness at one edge to a minimum thickness, then increasing continuously from said minimum to a maximum, and then decreasing continuously from said maximum to the thickness at said one side edge, and

said pipe is aligned for bending so that the thinner portion of the pipe is toward the bending axis and the thicker portion is away from the bending axis,

whereby a pipe having substantially uniform wall thickness along a circumference at the bend is obtained.

4,554,817

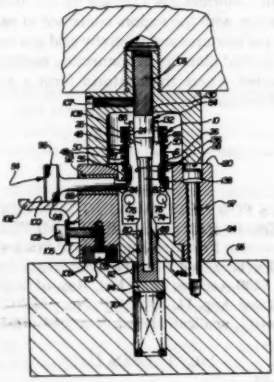
VALVE SLEEVE SHAPING METHOD

Stephen A. Dier, Fraser, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed May 10, 1983, Ser. No. 493,154

Int. Cl.⁴ B21D *53/00, 53/10*

U.S. Cl. 72—370 **4 Claims**



1. A method of shaping at least a portion of a groove edge of a groove on an internal surface of a valve sleeve, said groove edge being defined by the intersection of a groove defining surface and the internal surface of the valve sleeve, including the steps of:

mounting the valve sleeve in a surrounding relation to a tool having a working surface for shaping the groove edge,

locating the groove edge in alignment with the working surface and fixing the valve sleeve in a predetermined aligned angular position with respect to the tool,

moving the tool radially outwardly of the internal surface of the valve sleeve and into engagement with at least a portion of the groove edge to thereby effect shaping of said at least a portion of the groove edge, and

moving the tool radially inwardly of said internal surface to return the tool to its initial position after shaping said at least a portion of said groove edge.

4,554,818

MANUAL CABLE CLAMP CLOSURE

Guenter F. Kuehling, Berwyn, Ill., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 1, 1983, Ser. No. 528,676

Int. Cl.⁴ B21D *7/06, 53/36*

U.S. Cl. 72—410 **5 Claims**

1. An apparatus for applying a clamping force to a cable clamp of an electrical connector, comprising:

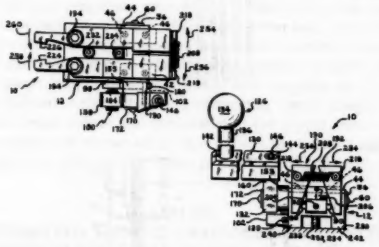
a base means, said base means having at least first and second surfaces meeting along a common line, a first channel defined in said first surface parallel to said common line and extending to a first end of said base means, a second channel transverse to said first channel and extending between two sides of said base means, said second channel receiving a shaft therein;

said shaft having a first portion being received in said second channel and bridging said first channel and being restrained from movement transverse to said shaft by retaining means affixed to said first surface and bridging portions of said second channel;

camming means affixed to a portion of said shaft disposed within said first channel and rotating therewith, said camming means having an actuating portion extending from said first channel and beyond a third surface of said base means, said third surface being transverse to said first and second surfaces;

first and second jaw means pivotably mounted to said first surface distal to said third surface for movement parallel to said first surface to clamp said cable clamp;

said first jaw means having a first cam surface, and said



second jaw means having a second cam surface, said first and second cam surfaces being disposed facing each other and in contact with and being resiliently urged against said actuating portion and being adapted to be moved apart by said actuating portion when said shaft is rotated to move said actuating portion towards said first surface;

said first jaw means and said second jaw means including respective first and second clamping surfaces, said first and second clamping surfaces being disposed facing each other and being moveable towards each other when said first and second cam surfaces are moved towards said first surface to provide said clamping force;

handle means affixed to said shaft for rotating said shaft;

stop means adjustably affixed to said second surface adjacent said second channel for limiting the motion of said handle means and including detent cavity means;

said handle means including mounting means for affixing said handle means to said shaft;

said mounting means including detent means adapted to cooperate with said detent cavity means and retain said handle means in a first position for releasably maintaining said clamping force.

4,554,819

METHOD OF AND APPARATUS FOR MEASURING IN SITU, THE SUBSURFACE BEARING STRENGTH, THE SKIN FRICTION, AND OTHER SUBSURFACE CHARACTERISTICS OF THE SOIL

Muhammad A. Ali, 10507 Odessa Dr., Sugar Land, Tex. 77478

Filed Sep. 28, 1983, Ser. No. 536,679

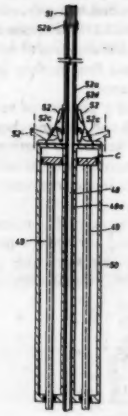
The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

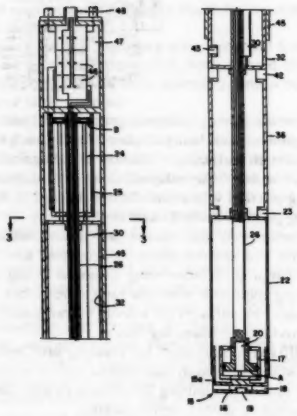
Int. Cl.⁴ G01N *3/42, 19/02*

U.S. Cl. 73—9 **10 Claims**

1. A method of determining the mobilized unit end bearing capacity of a soil in situ, comprising the steps of pushing a

probe into the soil to the desired depth, said probe having a plunger for exerting a downward force on the soil, determining the effective vertical stress in the soil, raising the plunger until the pressure acting on the face of the plunger equals the total vertical stress in the soil to remove the stress created in the soil by the insertion of the plunger, measuring the net upward





movement of the plunger, moving the plunger downwardly into the soil a preselected distance, measuring the force required to move the plunger said preselected distance to obtain a force vs distance curve for the plunger, and plotting mobilized unit end bearing of the soil against the distance the plunger is moved through the soil.

4,554,820

METHOD AND APPARATUS FOR OBTAINING THE COMBINED AROMA OF SEVERAL SUBSTANCES

Ira Litman, 41 Holiday Park Dr., Hauppage, N.Y. 11788

Division of Ser. No. 369,846, Apr. 19, 1982, Pat. No. 4,520,651. This application Oct. 4, 1984, Ser. No. 657,581

Int. Cl.[4] G01N *31/00*

U.S. Cl. 73—23 **14 Claims**

1. An apparatus for obtaining the combined aroma of several volatile substances comprising:

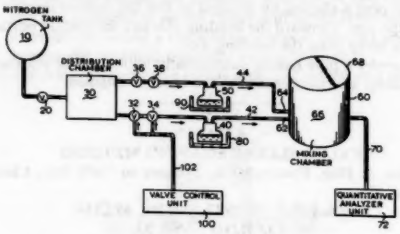
a source of odorless gas;

a plurality of closed containers with the volatile substances disposed therein, said containers being only partially filled so that each container contain said volatile substance in liquid and vapor form;

a first plurality of connecting means for supplying odorless gas from the source to each of said containers;

a blending chamber; and

a second plurality of connecting means connecting said containers to the blending chamber;



whereby the odorless gas supplied by the first connecting means mixes with the vapors contained in each container to form gas mixtures and whereby said gas mixtures flows via said second plurality of connecting means to the blending chamber where the mixtures form a gas composite with a determinable aroma.

4,554,821

APPARATUS FOR DETERMINING THE VISCOSITY OF FLUIDS, IN PARTICULAR BLOOD PLASMA

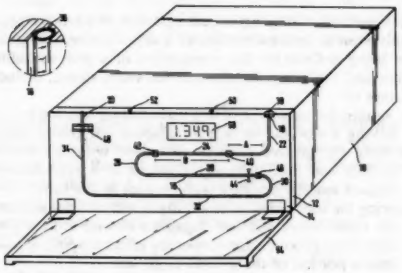
Holger Kiesewetter; Friedrich Jung, both of Stockwiese 44, 6650 Homburg-Kirrberg, and Hans-Günther Roggenkamp, Kullenhofstr. 36, 5100 Aachen, all of Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,203

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 3230246

Int. Cl.[4] G01N *11/04*

U.S. Cl. 73—55 **25 Claims**



1. Apparatus for measuring the viscosity of fluids comprising:

an outer housing including a front surface having a groove therein:

a disposable capillary tube means removably mounted in said groove and including at least one loop, each said loop having two substantially horizontal branches including an upper branch and a lower branch for flowing said fluid under the influence of gravity along a predetermined path; and

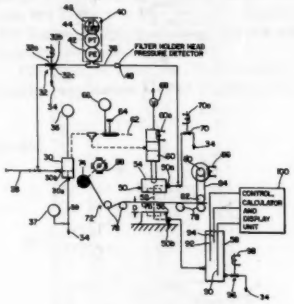
means for measuring the rate of flow of said fluid along said path in one of said horizontal branches.

4,554,822

PLUGGING FACTOR MONITOR UNIT

Roy J. Eisenhauer, Lakewood; Cary A. Loeser, Evergreen, both of Colo., and Charles G. Goodner, Jr., Yuma, Ariz., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 7, 1983, Ser. No. 502,034
Int. Cl.[4] G01N *15/00*
U.S. Cl. 73—61 R 18 Claims



1. A continuous automatic plugging factor testing and monitoring system, said system comprising:

means for receiving water samples and for raising the pressure of a sample to be tested to a predetermined test pressure;

means for continuously monitoring the pressure of the test sample;

filter holder means for receiving a test sample at said predetermined test pressure;

means for automatically supplying a filter membrane to said filter holder means, said filter holder means including a base member, and a movable member between a first, inoperative position and a second, operative position in engagement with said base member wherein said filter membrane is held in a test position between said movable member and said base member, said filter holder means further including means defining a flow path through said movable member, a filter membrane in the test position thereof and the base member;

collector tank means, connected to the outlet of the flow path of said filter holder means, for collecting the test sample flowing through the membrane under test and for measuring the filling time required for the test sample flow to reach a predetermined volume;

discharge valve means for controlling discharge of the contents of the collector tank means; and

automatic control means for monitoring the operation of said collector tank means and controlling the operation of said discharge valve means such that the discharge valve means is closed until a first said predetermined volume is measured out by said collector tank means and the filling time required to produce the first volume is measured, the discharge valve means is then opened so that the contents of the collector tank means are discharged through said discharge valve means, and after a predetermined time period set by said said automatic control means, the discharge valve means is closed so that a second said predetermined volume is measured out by said collector tank means and the filling time required to produce the second volume is measured,

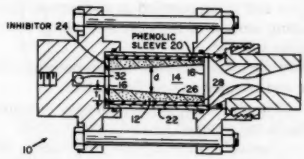
said filter membrane supplying means comprising means for providing raising of the filter membrane a predetermined distance from the base member of the filter holder when the movable member is moved to the first, inoperative position thereof.

4,554,823

METHOD FOR BURNING RATE CHARACTERIZATION OF SOLID PROPELLANTS

Jay S. Lilley, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 25, 1984, Ser. No. 624,063
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 7 Claims



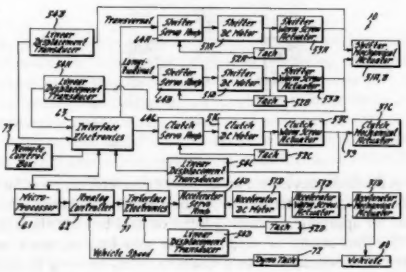
1. A system for providing characterization of burning rate of solid propellant motors from a single motor firing, comprising: a tapered solid propellant motor for providing a variable burning rate output, an analog to digital converter having an input and an output, a single pressure transducer coupled between said motor and said converter input for sensing variable head gas pressure output from said motor and coupling an output signal indicative thereof to said converter, means coupled to said converter output and responsive to the output therefrom for providing an output signal that defines the burning rate of said motor in response to output pressure.

4,554,824

AUTOMATED MANUAL TRANSMISSION SHIFTER WITH ELECTRONIC CONTROL ACTUATORS EXTERNAL OF THE VEHICLE

Francis G. King, Bloomfield Hills, and Stewart V. Gable, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 17, 1984, Ser. No. 682,524
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117 11 Claims



1. A transmission gear and clutch shifting apparatus for the automatic operation of a manual gear shift mechanism in an automotive vehicle, the automotive vehicle having a gear shift lever with a plurality of manual shift positions, said gear and clutch shifting apparatus including:

a gear shift mechanical actuation means mounted in the vehicle and coupled to the gear shift lever having a first flexible cable for causing actuation of the gear shift lever along the longitudinal axis of the vehicle, and a second flexible cable for causing actuation of the gear shift lever along the transverse axis of the vehicle,

said gear shift mechanical actuation means including a first

coupling slot means having an elongated slot generally aligned with the transverse axis of the vehicle for passing the gear shift lever and being coupled to said first flexible cable by a rotation means so that motion of said first flexible cable along the transverse axis of the vehicle causes motion of the slot of said first coupling slot means along the longitudinal axis of the vehicle,

said gear shift actuator further including a second coupling slot means having an elongated slot generally aligned with the longitudinal axis of the vehicle for passing the gear shift lever and being coupled to said second flexible cable for causing motion of the gear shift along the transverse axis of the vehicle;

a first cable electronic actuator means mounted outside the vehicle and coupled to said first cable;

a second cable electronic actuator means mounted outside the vehicle and coupled to said second cable;

a clutch mechanical actuation means mounted in the vehicle and coupled to the clutch pedal, and including a third flexible cable for causing movement of the clutch; and

a third cable electronic actuator means mounted outside the vehicle and coupled to said third cable.

4,554,825

DAMPING DEVICE OF AN AIR FLOW RATE METER DISPOSED IN THE AIR INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE

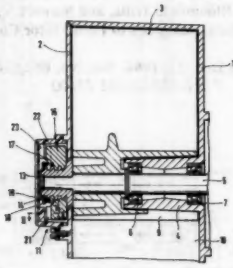
Eberhard Biermann, Uhldingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,041

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315706

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—118 **1 Claim**



1. A damping device for an air flow rate meter disposed in an intake tube of an internal combustion engine, a bearing shaft, means for applying a restoring force on said bearing shaft said air flow rate meter is supported on said bearing shaft and rotated in accordance with a quantity of air flowing through said intake tube counter to a restoring force, a guide bushing connected with one end of said bearing shaft, with thread-like grooves on its circumference, a blocking body provided with inner thread-like grooves that matches said thread like grooves on said bearing shaft, a compression spring supported on said blocking body, said blocking body is rotatable on the guide bushing and is supported such that said blocking body is axially displaceable counter to said compression spring in a direction toward a detent body attached to a housing, said detent body and said blocking body each have latch protrusions oriented toward one another, which upon an axial movement of said blocking body toward the detent body, said latch protrusions mesh with one another to damp said air flow rate meter.

4,554,826

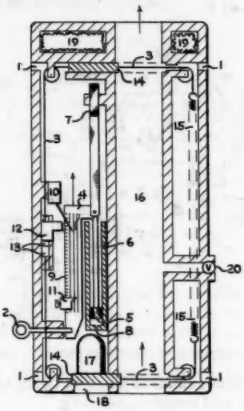
AUTOMATIC DEPTH-DETERMINING AQUATIC SAMPLING DEVICE

Judith A. Barry, 4515 W. 15th Ave., Vancouver, B.C., Canada (V6R 3B3)

Filed Jan. 28, 1982, Ser. No. 343,397

Int. Cl.⁴ G01N *1/00*

U.S. Cl. 73—170 A **4 Claims**



1. An apparatus for collecting water at predetermined depths in water comprising: the means for the apparatus to continually monitor its depth in water through the relation of velocity to time, where velocity is known from the constant and predictable rate with which the apparatus undergoes free-fall descent, and time is measured from the rate and distance of travel of a piston operating under constant force, where the piston's constant and predictable rate of travel is governed by the diameter of the metering orifice located in the bottom base of the cylinder housing the piston, the orifice controlling the rate at which the piston is able to draw water into the cylinder; means to pre-program sampling depth prior to descent of the apparatus by setting an adjustable triggering stop or series of stops onto a calibrated depth scale, the calibrations derived from the constant and predictable time of travel of the piston; means by which the travel of the piston causes motion of the depth scale relative to an inscriber on a standard temperature sensor, causing a continuous plot of temperature as a function of depth to be inscribed on the depth scale; means to vary the range of depths in which collection occurs by varying the time in which the piston travels its maximum distance by modifying the rate at which either the piston or the apparatus travels, these variations effected by modifying such parameters as the amount of ballast or the diameter of the metering orifice, where each depth range has a corresponding interchangeable depth scale; a sampling chamber or assembly of chambers equipped at both ends with gate valves which seal a chamber for sample collection, these gate valves urged into the post-sampling position by spring force; a mechanical device which restrains the gate valves in their pre-sampling position until released at the time of sample collection; means to collect a water sample by attaching the calibrated depth scale to the piston so that the depth scale and its attached triggering stops or series of stops travel at the same constant and predictable rate as does the piston, this travel causing a triggering stop to impinge on the mechanical device restraining the gate valves in their pre-sampling position, this impingement releasing the restraint on the valves so they assume their post-sampling position and seal the sample chamber which corresponds to that sampling depth; means for releasing a ballast following completion of the final collection, the release being pre-programmed on the depth scale in the same manner as that to

pre-program the collection of water samples; a sufficient amount of very low density material as to render the apparatus positively bouyant upon release of the ballast, compelling the apparatus to ascend to the surface unaided by forces external to the apparatus.

4,554,827

WIND INDICATORS

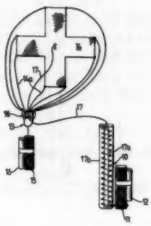
Trevor R. Kirby-Smith, Woking, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 9, 1984, Ser. No. 598,433

Claims priority, application United Kingdom, Apr. 14, 1983, 8310177

Int. Cl.[4] G01P *13/00*

U.S. Cl. 73—189 **15 Claims**



1. A wind indicator comprising:

a datum element carrying a datum marker,

a status element including a status marker and a parachute having shroud lines,

a cord store, and

a cord in said store linking said datum element and said parachute,

the arrangement being such that said wind indicator is portable by a parachutist and droppable so that initially said parachute inflates and said cord pays out from said cord store, wherein said parachute is collapsed by the action of said cord when said cord becomes taut, and wherein said parachute reinflates following landing of said datum element when said cord becomes slack, and said status element then floats to the ground, the ground distance and direction of said status marker from said datum marker providing to the said parachutist an indication of wind speed and direction.

4,554,828

MEASURING DEVICE FOR THE MAGNETO-INDUCTIVE MEASURING OF THE FLOW RATE OF A LIQUID MEDIUM

Friedhelm Doll, Wermelskirchen, Fed. Rep. of Germany, assignor to Turbo-Werk Messtechnik GmbH, Cologne, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,647

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3236909

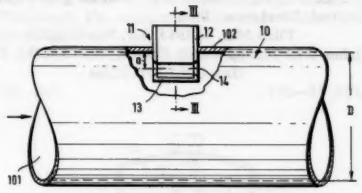
Int. Cl.[4] G01F *5/00, 1/58*

U.S. Cl. 73—202 **8 Claims**

1. A device for measuring the magneto-inductive flow rate of a flowing liquid medium in a flow channel, comprising:

a probe extending into the flowing liquid medium, said probe containing a continuous measuring channel therethrough, the probe including an electromagnet having a coil generating a magnetic field in the measuring channel, and at least two electrodes disposed at the wall of the measuring channel within the range of the magnetic field,

wherein the measuring channel extends transversely through a casing of the probe projecting into the flow channel and wherein said portion of the casing projecting into the flow channel is substantially of cylindrical shape; wherein the measuring channel is substantially of cylindrical shape and is disposed near the wall of the flow channel



and wherein the electromagnet is mounted inside the casing and comprises a core that passes through the coil and is affixed to pole members which extend in proximity to both sides of the measuring channel.

4,554,829

DEVICE FOR MEASURING THE MASS OF A FLOWING MEDIUM

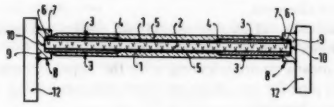
Jaihind S. Sumal, Vaihingen-Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 626,092

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1983, 3328852

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **5 Claims**

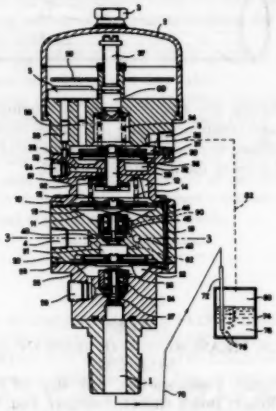


1. A device for measuring the mass of a flowing medium comprising a rectangular carrier, at least one temperature-dependent resistor layer supported on at least one surface of said rectangular carrier along a middle portion thereof and electrically conductively joined to at least two electrical connectors, each of said electrical connectors contacts a respective end face of the carrier, connecting electrical conductive layers having low electrical resistance on opposite ends of said at least one carrier surface in electrical contact with opposing ends of the temperature-dependent resistor layer with an end portion of said electrical conductive layers overlapping adjacent ends of the temperature-dependent resistor layer supported on the carrier, and the remainder of said electrical conductive layers directly on said carrier surface, each of said connecting electrical layers including a contact end section oriented in the direction of said electrical connectors and in electrical contact therewith, and the temperature-dependent resistor and the connecting layers are covered with a thin layer of glass except for one contact section on the ends of each of the connecting layers remote from the temperature-dependent resistor layer, and the contact sections are overlapped by securing sections of said connectors bent at an angle in the form end grips, each comprising a respective electrical connection, and are joined to said electrical conductive layers in an electrically conductive manner in said contact section.

4,554,830
LEVEL DETECTION HEAD FOR HYDROSTATIC EFFECT WITH PROTECTION

Danny J. Khoi, Saint Cloud, France, assignor to Materiel et Auxiliaire de Signalisation et de Controle pour l'Automation-Auxitrol, Courbevoie, France

Filed Mar. 2, 1983, Ser. No. 481,351
Claims priority, application France, Mar. 3, 1982, 82 03505
Int. Cl.[4] G01F *23/14*
U.S. Cl. 73—299 5 Claims



1. A head for detecting a level of a liquid in a tank by hydrostatic action, said head being connected with a probe that is immersed into the liquid, the level of which is to be measured, said head comprising:

a main enclosure subdivided into an upper chamber and a lower chamber,

an elastically adjustable membrane separating said upper chamber from said lower chamber,

probe means communicating with the upper chamber,

an inlet pipe for gas under pressure communicating with the lower chamber,

a valve connected to the membrane to control the pressure above the membrane in relation to the pressure below the membrane,

means for diverting the flow of gas to the upper chamber from the lower chamber,

a member sensitive to gas pressure for measuring the gas pressure that corresponds to a given flow of gas introduced through said inlet pipe compared to gas pressure from the tank to determine the height of the liquid in the tank, and

a connection of the lower chamber with the probe means comprises

an auxiliary chamber subdivided in an upper auxiliary chamber and a lower auxiliary chamber,

another membrane separating said upper auxiliary chamber from said lower auxiliary chamber, the upper auxiliary chamber communicating with the lower chamber and the inlet of the gas under pressure when said valve is open, and the lower auxiliary chamber communicating with the upper chamber and the probe means when said probe means is open to gas flow,

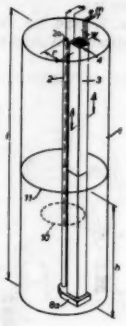
a calibrated elastic means of adjustment, and

a probe valve being mounted to close said probe means without receipt of gas under pressure in said upper auxiliary chamber, which will prevent a rising of the liquid of the tank through the probe means.

4,554,831
ARRANGEMENT AND METHOD FOR LIQUID LEVEL MEASUREMENT

Graham P. Sealey, Auckland, and Andrew C. Corney, Wellington, both of New Zealand, assignors to Tru Test Distributors Limited, Auckland, New Zealand

Filed Dec. 30, 1983, Ser. No. 567,320
Claims priority, application New Zealand, Aug. 4, 1982, 201498
Int. Cl.[4] G01F *23/28*
U.S. Cl. 73—304 R 16 Claims



1. A liquid level measuring arrangement comprising:

at least first and second spaced apart electrodes;

at least one elongate electrical coil;

said electrodes and said coil being adapted to be at least partially immersed in an electrically conductive liquid;

means being provided to pass an alternating current through and between said first and second electrodes, by way of said electrically conductive liquid, so as to create an electro-magnetic field about at least said first electrode;

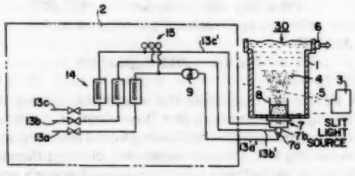
said elongate coil being shaped and located so that said electro-magnetic field induces a current in said coil;

means being provided to convert said electro-magnetic field into a substantially linear function of the depth of said electrically conductive liquid.

4,554,832
SIMULATOR OF FLUID FLOW IN FIELD OF FLOW ENTAILING COMBUSTION OR REACTION

Toshiaki Hasegawa, Saitama, and Yasuo Hirose, Kanagawa, both of Japan, assignors to Nippon Furnace Kogyo Kaisha, Ltd., Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,005
Claims priority, application Japan, Nov. 10, 1982, 57-196098
Int. Cl.[4] G01F *13/00*
U.S. Cl. 73—432 R 11 Claims



1. A simulator for the flow of a fluid in the field of flow entailing a combustion or reaction, which comprises a visualizing device provided with a model water tank, a compressed water source, a conduit interconnecting said model water tank and said compressed water source, an orifice inserted in said

conduit and having at least one small hole not more than 3 mm in diameter pierced therethrough such that local pressure drop of the compressed water during the passage thereof through said orifice may induce a phenomenon of deaeration resulting in release of a large volume of fine, substantially uniform air bubbles into the flow of water and consequent production within said water tank of a simulated field of flow by the portion of water flow containing said fine, substantially uniform air bubbles, and a slit light source for projecting a slit light upon said field of flow and thereby making visible said flow of water in a given cross section of said flow by virtue of the irregular reflection of said slit light by the air bubbles.

4,554,833

METHOD AND APPARATUS FOR DETERMINING THE UNBALANCE OF WHEELS MOUNTED ON THE DRIVE AXLE OF AN AUTOMOBILE

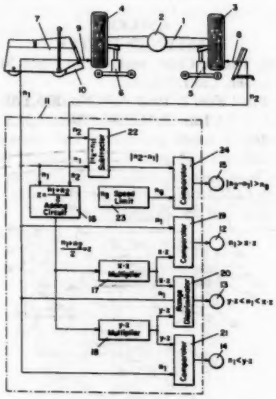
Eickhart Goebel, Pfungstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,213

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234043

Int. Cl.⁴ G01M *1/28*

U.S. Cl. 73—457 **14 Claims**



1. A method of determining the unbalance of two wheels mounted on a drive axle, said two wheels being operatively connected by a differential gear, said method comprising:

rotating said two wheels within a predetermined speed of rotation range;

changing the speed of rotation of one of said two wheels while said two wheels are being rotated within said predetermined speed of rotation range and thereby inversely changing the speed of rotation of the other of said two wheels in proportion to the change in speed of rotation of said one of said two wheels due to the connection of said two wheels by said differential gear;

measuring the difference in speed of rotation between said two wheels;

comparing said difference in speed of rotation with a predetermined difference in speed of rotation range; and

measuring the unballance of each of said two wheels in turn when said two wheels are rotating within said predetermined difference in speed of rotation range.

4,554,834

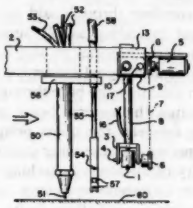
ACOUSTIC SENSOR AND METHOD OF USING SAME FOR DETERMINING THE POSITION OF A TOOL RELATIVE TO A WORKPIECE

Friedrich B. Prinz; James F. Hoburg, and Kristjan Gunnarsson, all of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Oct. 28, 1983, Ser. No. 546,519

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—597 **8 Claims**



1. A method for sensing the position of a tool relative to a workpiece comprising the steps of:

(a) placing a piezoelectric transducer having a curved surface with a single focal point above the workpiece so that the workpiece will be not more than six inches from the focal point of the curved surface;

(b) moving the transducer relative to the workpiece;

(c) applying a voltage to the transducer in a manner so as to cause the transducer to emit sound waves toward the workpiece while the transducer is at different positions relative to the workpiece;

(d) allowing each sound wave to be reflected back from the workpiece to the transducer and to strike the transducer at some time period after the sound wave was emitted;

(e) measuring the time period between emission of each sound wave and the striking of the transducer by that sound wave, and

(f) converting each measured time period into a distance thereby obtaining a surface profile of the workpiece.

4,554,835

AUTOMATIC FLAW DETECTION DEVICE

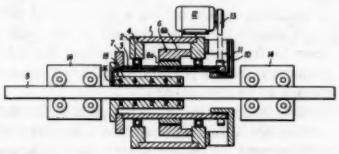
Toshio Sakuragi, Kobe; Kazuo Nakayama, Hyogo; Masaaki Sato, Kamakura, and Mitsuhiro Koike, Yokohama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1984, Ser. No. 590,449

Claims priority, application Japan, Mar. 19, 1982, 57-45091

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—640 **3 Claims**



1. An ultrasonic automatic flaw detection apparatus comprising:

(a) a supporting frame;

(b) a hollow shaft journaled in said supporting frame by axially spaced bearings located near the axial ends of said hollow shaft;

(c) a signal transmission device disposed within said supporting frame between said axially spaced bearings, said signal

transmission device comprising a rotor section mounted on and circumferentially surrounding said hollow shaft and a stator section mounted on said supporting frame and operatively connected to said rotor section;

(d) a flaw detection signal repeater mounted on said hollow shaft axially downstream of the downstream one of said bearings with reference to the direction the material to be inspected passes through said hollow shaft during use of the apparatus;

(e) a holder for ultrasonic searching units coaxially disposed within said hollow shaft and rotatable therewith, said holder extending through said flaw detection signal repeater and extending axially upstream from said flaw detection signal repeater in said hollow shaft to a point upstream of said signal transmission device, said holder having an axial through bore through which, during use of the apparatus, the material being inspected passes with a clearance between the outer periphery of the material being inspected and the inner periphery of said holder;

(f) a plurality of ultrasonic searching units mounted in said holder for ultrasonic searching units at axially spaced intervals within said hollow shaft;

(g) a water supply means mounted on said supporting frame for supplying water to the clearance between the said holder for ultrasonic searching units and the material being inspected; and

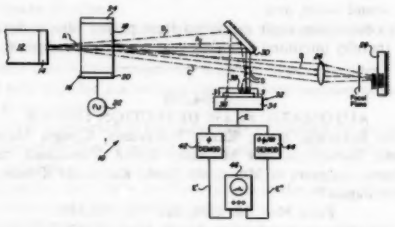
(h) drive means for rotating said hollow shaft, said rotor section, and said flaw detection signal repeater.

4,554,836

LASER VIBROMETER

Michael J. Rudd, Concord, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 31, 1984, Ser. No. 645,888
Int. Cl.⁴ G01B 9/02
U.S. Cl. 73—657 **8 Claims**



1. Apparatus for interferometrically measuring ultrasonic vibration on an object surface comprising:

means for propagating a beam of monochromatic light, said propagating means having a mirror at its emitting end;

light modulating means disposed in the path of the light beam for frequency shifting a portion thereof such that the frequency shifted portion is deflected toward the object surface to be measured;

adjustable means disposed in the path of the deflected beam portion for directing only the frequency shifted beam portion onto the object surface being measured and for focusing the reflected portion of the light scattered by the surface onto the end mirror of said propagating means from which it is divergingly reflected; and

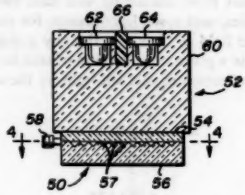
photoelectric means disposed in the paths of both the divergingly reflected light beam and the unshifted portion of the propagated light beam and responsive to both said beams, for generating a phase modulated electrical signal indicative of the amplitude and velocity of ultrasonic vibration on the object surface.

4,554,837

REFLECTIVE OPTICAL FLUID PRESSURE SENSOR

Hal C. Danby, Palo Alto, and Carl Ritson, San Jose, both of Calif., assignors to Anatros Corporation, San Jose, Calif.

Filed May 4, 1984, Ser. No. 607,060
Int. Cl.⁴ G01L 7/00
U.S. Cl. 73—705 **11 Claims**



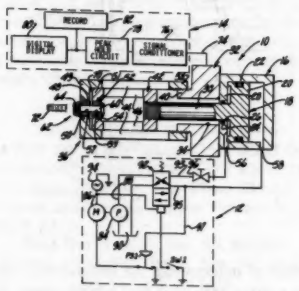
1. An optical fluid pressure sensor comprising a light source, a capillary passageway containing a gas and formed in a transparent solid, the capillary passageway having a reflective surface positioned in the light path of light from the light source, and a light detector positioned in the path of light reflected by the reflective surface, the capillary passageway having an inlet end means for receiving liquid from an external source under fluid pressure to be monitored and an outlet end, the outlet end thereof having a closure means for preventing escape of gas therefrom.

4,554,838

FASTENER TESTER

Lloyd L. Paus, Tustin, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Feb. 2, 1984, Ser. No. 576,120
Int. Cl.⁴ G01N 3/08
U.S. Cl. 73—761 **21 Claims**



1. A fastener tester for testing fasteners for securing a plurality of workpieces together with such fasteners including a pin member having an elongated shank, said fastener tester comprising:

a first housing member,

a second housing member,

said first and second housing members having first and second plate portions respectively, located at one end and adjacent to each other,

said first and second plate portions having first and second fastener openings, respectively, axially aligned with each other along a preselected axis and adapted to receive the pin member,

a load cell operatively connected to said first housing member,

said first and second housing members adapted for relative movement along said axis,

load means operatively connected to said second housing member and being selectively actuable for providing said relative movement whereby said adjacent plate portions can be move axially towards or away from each other,

said load means connected to said load cell,

adjustment means for selectively adjusting the distance between said first and second plate portions to simulate a desired grip increment for the fastener to be tested, said adjustment means providing movement of one of said first and second housing members relative to the other for adjusting the closest distance between said first and second plate portions to simulate said desired grip increment,

said first and second housing members having first and second access openings, respectively, permitting internal access for locating the fastener pin member in said aligned fastener openings whereby the fastener can be installed to urge said first and second plate portions together,

load transfer means for transferring the relative force between said first and second plate portions to said load cell whereby said load cell will provide a signal having a magnitude varying in accordance with variations in the magnitude of the installation load on the fastener urging said first and second plate portions together,

said load means actuable to move said first and second plate portions away from each other whereby the installed fastener can be subject to tensile loading varying in magnitude,

said load transfer means transferring the relative force between said first and second plate portions to said load cell whereby said load cell will provide a signal having a magnitude varying in accordance with variations in the magnitude of the tensile load applied to the fastener as said first and second plate portions are urged to move away from each other.

4,554,839

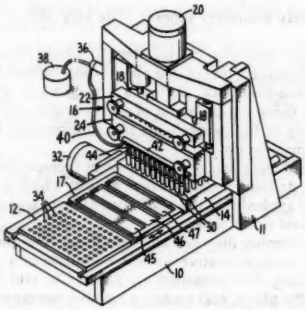
MULTIPLE TROUGH VESSEL FOR AUTOMATED LIQUID HANDLING APPARATUS

Gary E. Hewett, San Francisco; Brian G. Atwood, Walnut Creek, and Timothy J. Wennberg, San Francisco, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Oct. 14, 1983, Ser. No. 542,114

Int. Cl.⁴ G01N *35/06*

U.S. Cl. 73—864.16 **4 Claims**



1. In a machine for automatically transferring at least a portion of a liquid supply to one row of wells to fill or mix with liquid samples in said one row or with another row of wells which includes:

a head assembly translatable between upper and lower positions along a vertical axis;

means for moving said head assembly along said vertical axis; and

a plunger assembly mounted on said head assembly for movement therewith, said plunger assembly including a row of pipette nozzles, each having a depending end to receive a tip, a row of plungers respectively disposed within said pipette nozzle, and means for moving said plungers within said pipette nozzles to vary their internal volumes to aspirate liquid into or discharge liquid from said tips,

the combination of a table mounted beneath said head for translation along a horizontal bed, said table having a plurality of work stations spaced along said bed for respectively accommodating at least one row of a plurality of rows of wells in at least one tray at each of said work stations and a vessel having a plurality of troughs parallel to said plurality of rows of wells to accommodate a second plurality of said work stations;

means for moving said table along said horizontal bed selectively to place any one of said rows of wells in said at least one tray or one of said plurality of troughs at said work stations in register with said pipettes,

means for controlling each of said moving means for said head assembly, plungers and said table to effect liquid transfer between said one trough and said one row of wells in a tray at said work stations, and

receptacle means for storing a plurality of rows of replaceable tips for the ends of said pipettes nozzles at a third plurality of work stations on said table to permit disposal and replacement of said tips on said depending ends of said pipette nozzles with other tips disposed in at least some of the receptacles of said receptacle means between predetermined steps of a liquid transfer process.

4,554,840

ANTI-WOBBLE DEVICE FOR A CONNECTING ROD

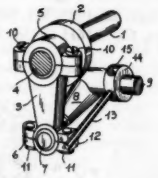
Franco Marchesi, Pavia, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Aug. 23, 1984, Ser. No. 643,574

Claims priority, application Italy, Feb. 28, 1984, 19823 A/84

Int. Cl.⁴ F16H *21/52*; D05B *57/02*

U.S. Cl. 74—42 **5 Claims**



1. An anti-wobble device for a connecting rod that joins a crankshaft to an arm fixed to an oscillating driven shaft whose axis is oriented 90° with respect to the axis of the crankshaft, the joints at each end of the crankshaft having spherical mating surfaces, said anti-wobble device comprising a rigid element secured at one end for oscillation with the driven shaft and contacting the joint connecting the connecting rod to the arm at the other end, and means for adjusting said rigid element both radially and axially with respect to the driven shaft.

4,554,841

SPEED CONTROL DEVICE OF A TORIC TYPE INFINITELY VARIABLE TRANSMISSION

Hideo Okoshi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

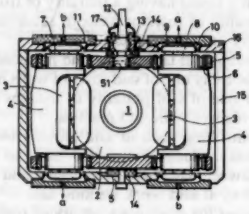
Filed Nov. 4, 1983, Ser. No. 548,834

Int. Cl.⁴ F16H *15/08*

U.S. Cl. 74—200 **10 Claims**

1. A speed control device of a toric type infinitely variable transmission having a housing, an input and an output shaft rotatably and coaxially supported by said housing, an input and an output disc fitted on said input and output shafts, respectively, and engaged with said shafts for rotation therewith, the

opposed surfaces of said discs cooperating with each other to form a toroidal cavity, left and right traction rollers disposed in said toroidal cavity symmetrically with respect to the axis of said input and output shafts, trunnion devices rotatably supporting said traction rollers and supported by said housing for rotation about pivot axes perpendicular to the axes of rotation of said traction rollers, and pressing means for urging said input and output discs on said traction rollers into engagement with each other and causing a traction force, characterized by



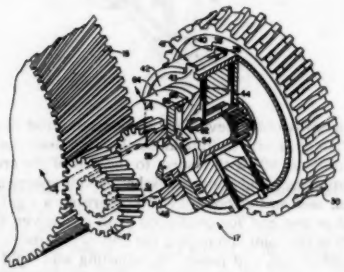
a support device for supporting respective pivot shaft ends so that the pivot shafts of said left and right trunnion devices are slightly tiltable, and a tilting device for slightly moving said support device leftward and rightward and tilting said trunnion devices by a predetermined amount, said support devices including a support link member for connecting the upper and lower pivot shaft ends of each of said left and right trunnion devices using bearing means, said support link members being supported in said housing for slight leftward and rightward movement.

4,554,842

ANTI-BACKLASH MECHANISM FOR MACHINE DRIVE

David B. Wood, III, West Chester, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 25, 1983, Ser. No. 487,962
Int. Cl.⁴ F16H *55/18, 57/00*
U.S. Cl. 74—409 **5 Claims**



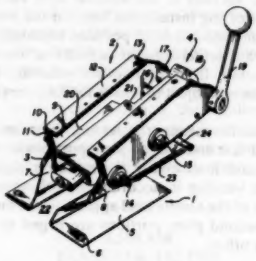
1. An anti-backlash mechanism for a machine drive, comprising:
(a) a machine base;
(b) a drive mechanism carried by said base;
(c) a support shaft, rotatably carried by said base;
(d) a torque input member rotatably carried by said shaft, in driving connection with said drive mechanism;
(e) first and second clutch units, each coupled to said torque input member;
(f) first and second helical gears carried coaxially on said shaft, said first gear torsionally and axially fixed with respect to said shaft, and said second gear torsionally and axially free to slip with respect to said shaft;
(g) means for keying said first gear to said first clutch unit;
(h) means for keying said second gear to said second clutch unit;
(i) a first linear actuator interposed between and reacting against, said first and second gears;
(j) a second linear actuator interposed between and reacting against, said second gear and said clutch units;
(k) means for powering said first and second actuators; and
(l) an output gear, rotatably carried by said base in mesh with said first and second gears.

4,554,843

ADJUSTABLE STEERING COLUMN SUPPORT

Henry Andersson, Saltsjoboo, Sweden, assignor to Affarsverket FFV, Eskilstuna, Sweden

Filed Feb. 17, 1984, Ser. No. 581,059
Claims priority, application Sweden, Feb. 23, 1983, 8301001
Int. Cl.⁴ B62D *1/18*
U.S. Cl. 74—493 **5 Claims**



1. A vehicle steering column support that provides for adjustment of an elongated steering column lengthwise in opposite axial directions and angularly in opposite swinging directions that are transverse to said axial directions, said steering column support comprising:
A. a plurality of flatwise adjacent plates, each having a flat friction surface that opposes the friction surface on an adjacent plate, said surfaces being oriented parallel to said axial directions and said swinging direction, and said plates comprising
(1) a relatively stationary support plate securable to a vehicle, and
(2) a relatively movable carrier plate to which the steering column is secured, one of said plates being flatwise flexible into surface-to-surface frictional engagement with the other but being normally out of such engagement to permit shifting of the carrier plate in said directions relative to the support plate;
B. means on said one plate, at the side thereof remote from said other plate, defining a slide surface against which a flexing force can be applied that holds said one plate in said engagement with said other plate;
C. a wedging member disposed adjacent to said one plate and confined to motion relative to said one plate in a pair of opposite sliding directions that are parallel to said friction surfaces of the plates, said wedging member having a wedging surface at one side thereof that forces obliquely towards said friction surfaces of the plates and diverges from then in one of said sliding directions, said wedging surface being slidingly engaged with said slide surface so that movement of said wedging member in said one siding direction applies said flexing force to said slide surface;
D. spring means biasing said wedging member in said one sliding direction with a biasing force high enough to normally maintain said flexing force on said slide surface; and
E. release means comprising a lever which has a connection with said wedging member and which is manually swingable away from a normal position to move said wedging member in the other of said sliding directions and thus relieve said

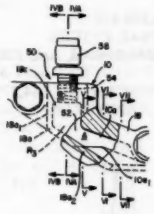
flexing force, said lever, through its connection with the wedging member, being biased by said spring means towards its said normal position to return thereto upon being released.

4,554,844

AIR BREATHER FOR POWER TRANSMISSION UNIT

Hideo Hamano, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 21, 1983, Ser. No. 477,399
Claims priority, application Japan, Mar. 31, 1982, 57-53434
Int. Cl.⁴ F16H *57/04*
U.S. Cl. 74—606 R **6 Claims**



1. An air breather apparatus for a transmission, comprising:

a transmission casing for containing a transmission, the casing having formed on an open end thereof an upright peripheral seating face and an upright wall portion;

a cover for sealably closing said open end, the cover having;

an upright peripheral seating face sealably engaging said casing seating face to seal the periphery of said transmission casing;

a rib laterally protruding from an inner face of the cover and sealably engaging said casing wall portion along an upper portion of the length of said rib, at least a portion of said rib extending substantially diagonally downwards from an upper portion of said cover towards a lower side portion of said cover, and a lower portion of said rib being exposed to an interior of said casing;

an air chamber in an upper portion of said cover, one wall of said air chamber being formed by said casing wall portion and at least one additional wall being formed at least partially by said rib; and

a vent communicating between an upper end of said air chamber and an exterior of said cover, said vent having an air breather plug assembly inserted therein;

wherein said rib, said cover innerface, said cover seating face and said casing seating face define therebetween an air passage communicating between said casing interior and a lower portion of said air chamber, an upper portion of said passage being substantially narrower than a lower portion of said passage, and said air chamber having a substantially greater cross-sectional area than said air passage.

4,554,845

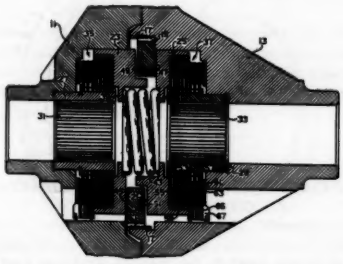
POSITIVE DRIVE AND SECONDARY CLUTCH MEANS THEREFOR

Edward J. Goscenski, Jr., 2267 Gethings Rd., Battle Creek, Mich. 49017

Continuation-in-part of Ser. No. 432,192, Oct. 1, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 538,030
Int. Cl.⁴ F16H *35/04*; F16D *19/00*
U.S. Cl. 74—650 **17 Claims**

1. In a positive drive of the type including an input member adapted to be driven by input driving torque transmitted from a power source, first and second output members adapted to drive first and second output shafts, first and second clutch means operably associated with said first and second output members, respectively, each of said clutch means having a disengaged mode which allows its respective output member to rotate relative to said input member when said respective output member is rotating at an angular velocity in the direction of torque transmittal that is greater than one predetermined angular velocity condition of the output members, and an engaged mode which maintains a predetermined rotational relationship between said respective output member and said input member when said respective output member is rotating at an angular velocity in the direction of torque transmittal that is equal to or less than another predetermined angular velocity condition of the output members, first and second means operably associated with said first and second clutch means, respectively, to move the respective clutch means from said disengaged mode to said engaged mode, characterized by:

(a) at least one of said first and second clutch means including a primary clutch operable, in the engaged mode, to transmit torque from said input member to the respective output member, and a secondary clutch operable, in either the engaged or disengaged mode of said primary clutch, to transmit torque from said input member to the respective output member during relative rotation between said input and the respective output member;



(b) means for exerting a torque preload on said secondary clutch; and

(c) the net rotational clearance of said secondary clutch, relative to said input member, being selected such that the product of said torque preload and said net rotational clearance provides a predetermined rotational dampening between said input member and each of said output members in response to relative rotational movement therebetween.

4,554,846

TWO-PIECE RETAINER FOR EPICYCLIC TRANSMISSIONS

Robert G. Distin, Jr.; Thomas J. Lang, both of Louisville, and David E. Smith, Lafayette, all of Colo., assignors to Advanced Energy Concept "81 Ltd., Boulder, Colo.

Filed Feb. 10, 1984, Ser. No. 578,933
Int. Cl.⁴ F16H *1/28*
U.S. Cl. 74—805 **16 Claims**

1. An epicyclic speed reducing transmission, comprising:

first gear means (**70**) having a first surface region (**72**);

second gear means (**50**) having a second surface region (**53**) which confronts said first surface region;

cam means (**10, 30**) for orbitably driving one of said gear means and said corresponding confronting surface regions;

a set of cylindrical rollers (**80**) disposed between said first and second confronting surface regions for transmitting torque therebetween;

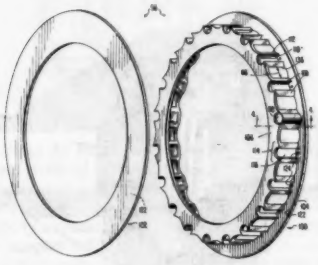
said first and second confronting surface regions each comprising a series of lobes (**126**) and recesses (**128**) shaped and arranged such that a first recess (**128'**) on said first confronting surface region confronts a second recess (**128''**) on said second confronting surface region and also

such that a first lobe (126') on said first confronting surface region confronts a second lobe (126") on said second confronting surface region;

said first and second confronting recesses being on a substantially diametrically opposite side (130, 132) of said first and second confronting surface regions, respectively, than said first and second confronting lobes;

said first and second confronting surface regions being further shaped and arranged such that only one of said cylindrical rollers can be contained between said confronting recesses and only one of said cylindrical rollers can be contained between said confronting lobes;

a retainer (96) for retaining said plurality of cylindrical rollers in spaced relationship between said first and second confronting surface regions, said retainer comprising:



a first retainer piece (100) including a top (106) and a bottom (104) surface interconnected by a plurality of bars (108), said bars being shaped and arranged into a pluarlity of pairs (114) each of which includes first and second bars having confronting first curved surfaces between which one of said cylindrical rollers can be rotatably retained;

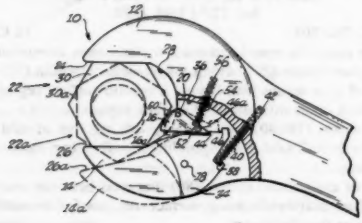
said first and second bars of each of said pairs each having further second and third surfaces (112) extending from opposite ends of said respective curved surface thereon and which continuously taper inwardly towards one another and meet at an apex (136) so that each bar has a wedge-like shape, respective apexes of said first and second bars of each of said pairs of bars facing and being separated from respective apexes of bars of adjacent pairs of bars so that adjacent pairs of bars are separated by empty space.

4,554,847

OPEN END RATCHET WRENCH

Ercele A. DeSantis, 1759 Terr. Dr. West, Lake Worth, Fla. 33460

Filed Mar. 2, 1984, Ser. No. 585,524
Int. Cl.⁴ B25B *13/28*
U.S. Cl. 81—111 **20 Claims**



1. An open end wrench used to secure a nut comprising:

a main body integrally forming an upper jaw and a back;

a lower jaw pivotably connected to said main body to pivot between first and second positions respectively displacing said lower jaw from said upper jaw by first and second distances, said lower jaw including a cam having a tooth therein;

said first distance allowing said wrench to rotate said nut as it is rotated and said second distance allowing said wrench to rotate around said nut as said wrench is rotated; and

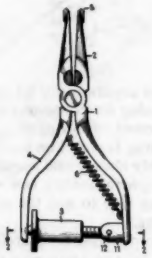
release means for releasing said lower jaw to pivot from said first position to said second position, said release means including a pawl extending from said body to between said jaws, said pawl being pivotally connected to said body to pivot between a first cam position engaging said tooth and a second cam position disengaged from said tooth.

4,554,848

INTERNAL PLIERS

Joseph L. Galleto, 4759 N. Maplewood, Apt. 108, Chicago, Ill. 60625

Filed Aug. 27, 1984, Ser. No. 644,575
Int. Cl.⁴ B25B *7/14*
U.S. Cl. 81—447 **5 Claims**



1. Internal pliers comprising:

A. a pair of pliers having jaws suitable for internal gripping;

B. a pin-yoke attached to the inside of one handle of said pliers, the second handle having a notch in it toward the inside;

C. a pin passing through the pin-yoke; and

D. a removable expander means which comprises: a threaded adjuster having at one end a fork that is engaged by and removable from the pin that passes through the pin-yoke, and an internally-threaded thumbscrew having a rounded pin at its end that engages the notch in the pliers' handle, said thumbscrew screwing in and out on the threaded adjuster to adjust the spread of the pliers' handles.

4,554,849

METHOD AND APPARATUS FOR PUNCHING HOLES IN POLYMER TUBES

Thomas Benham, Lake Jackson, Tex., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Dec. 29, 1983, Ser. No. 566,901
Int. Cl.⁴ B26F *1/38*
U.S. Cl. 83—40 **14 Claims**

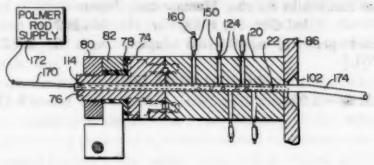
1. A method of punching a hole in a wall of a section of a polymer tube, comprising

inserting the polymer tube section into a guideway extending through a punch mount,

inserting an end section of a continuous supply of monofilament polymer rod into the tube section,

driving a tubular punch through the wall of the tube section in the guideway and into the polymer rod end section to sever a hole piece from the tube wall and to force the severed hole piece into the tubular punch,

withdrawing the tubular punch and hole piece to form a hole in the wall of the tube section, and



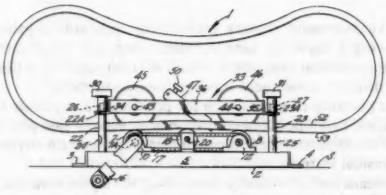
severing the end section of the monofilament so as to present an unmarred polymer rod end section for a subsequent punching.

4,554,850

MACHINE FOR CUTTING V-BELTS FROM A V-BELT BAND

James W. Edgar, and Edward J. Edgar, both of 55 Ayers Rd., Eugene, Oreg. 97401

Filed Jul. 19, 1984, Ser. No. 632,394
Int. Cl.[4] B29H *7/22, 3/06;* B26D *1/02*
U.S. Cl. 83—178 **10 Claims**



1. A machine for cutting a V-belt from a band of V-belts wherein adjacent belts are joined by a severable web, said machine comprising,

a base,

rolls journalled on said base and on which a V-belt may be supported,

drive means for imparting rotation to said rolls,

a frame,

support means on said base movably mounting said frame above said base, and

a carriage slidably carried by said frame for travel along a path parallel to the axes of said rolls transversely of a band of V-belts thereon, said carriage having radially aligned belt engaging wheels for rolling engagement with adjacent V-belts and spaced above the web joining the said V-belts, a knife body on said carriage body having a blade for disposition in the path of the last mentioned web.

4,554,851

APPARATUS FOR SEVERING EXTRUDED LIGHT SECTIONAL MEMBERS

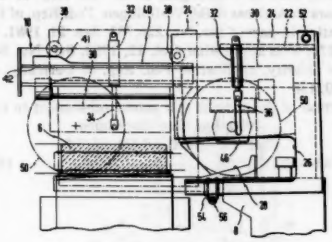
Friedrich W. Elhaus, Dorfstrasse 21, 7761 Moos, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,533
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3328032
Int. Cl.[4] B23D *81/00*
U.S. Cl. 83—213 **9 Claims**

1. Apparatus for severing extruded light sectional members formed of an aluminum alloy or the like produced along an extruder runout path (2), comprising

(a) a machine frame (8) mounted adjacent the extruder runout path, said frame including a cantilever (10) that extends horizontally over the runout path;

(b) saw means connected with said cantilever for transverse movement between operative and retracted positions relative to said runout path, said saw means including a saw carriage (46), a motor (48) mounted on said carriage, and a saw blade (50) driven by said motor; and



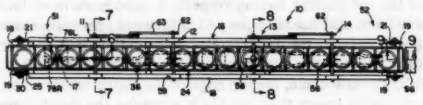
(c) shear means connected with said cantilever for movement between operative and retracted positions relative to said runout path, said shear means including a shear frame (24), and a pair of relatively movable shear knives (28,30) mounted on said shear frame.

4,554,852

CUTTING MACHINE FOR SLICING CIRCULAR ARTICLES INTO WEDGES

Robert L. Sauer, Hudson; Charles G. Morrissette, Shaker Heights; Stanley J. Garbaczik, Sr., and Stanley J. Garbaczik, Jr., both of Maple Heights, all of Ohio, assignors to Food Equipment Manufacturing Corporation, Maple Heights, Ohio

Filed Jul. 26, 1983, Ser. No. 517,467
Int. Cl.[4] B26D *3/24*
U.S. Cl. 83—407 **3 Claims**



1. A rotary cutting machine comprising:

an endless conveyor;

a product holding carrier adapted to be transported by said conveyor;

a cam track adjacent said conveyor and longitudinally parallel thereto;

a plurality of rotary blade cutting means positioned at stations longitudinally along said conveyor to intercept said carrier as it is sequentially conveyed past said cutting means;

said carrier comprising an outer frame portion drivingly secured to said conveyor and an inner portion rotatable within said frame portion; and

a pair of cam followers secured to said inner portion and adapted to engage said cam track, whereby said inner portion may be angularly turned responsive to the location of said cam followers along said cam track, said cam track alternating between a single track and a double track, and including means to switch said pair of cam followers from said single track to one follower on each track of said double track whereby said inner portion is angularly shifted responsive to the shifting of said cam followers from said single track to said double track, one of said cutting means being positioned to intercept said inner portion after each angular shift, the relative spacing between the tracks of the double track varying at different stations of the cutting means in a manner which causes the product to be cut at angles of less than 90 degrees.

4,554,853

SAFETY ARRANGEMENT FOR A SAW CHAIN OF A POWER-DRIVEN CHAIN SAW

Karl Nitschmann, Schorndorf; Hans Dolata, and Günter Dietzsch, both of Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

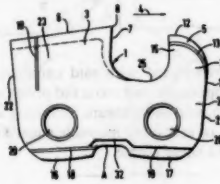
Continuation-in-part of Ser. No. 226,731, Jan. 21, 1981, Pat. No. 4,409,874. This application Oct. 12, 1983, Ser. No. 541,301

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1980, 3002138

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.[4] B27B *17/00, 33/14*

U.S. Cl. 83—522 16 Claims



1. A safety arrangement for the saw chain of a chain saw such as a power-driven chain saw or the like, the saw chain including a plurality of cutting links, a plurality of connecting links, and a plurality of driving links pivotally interconnected to define the saw chain, each of the cutting links being a body including: a rearward wall having an upwardly-extending portion and a bent-over top portion defining the blade of the cutting link, the top portion extending in a direction transversely to the upwardly-extending portion to conjointly define therewith an inside angle, the upwardly-extending wall portion and the top portion having respective outside surfaces facing away from said inside angle; and, a forward upwardly-extending wall defining the depth limiter of the cutting link, the depth limiter having a top engaging edge for engaging the work to be cut by the saw chain, the top edge of the depth limiter being at an elevation lower than the blade whereby the depth limiter limits the depth of cut of the blade and the cutting load which can be applied to the blade and the upwardly-extending portion of the rearward wall; the walls conjointly defining a notch formed in the body thereby placing the blade in spaced relationship to the depth limiter; the body being bounded by a leading edge defined by the foremost edge of the depth limiter and a trailing edge defined by the rearmost edge of the rearward wall, the leading and trailing edges facing respectively into and away from the direction of travel of the cutting link; the safety arrangement comprising:

a first safety mark formed in the outside surface of said upwardly-extending portion and across said bent-over top portion of said rearward wall, said first safety mark defining a line disposed at a predetermined distance from said trailing edge and extending in a direction substantially parallel thereto;

a second safety mark formed in the wall of the depth limiter and extending from the leading edge to the notch at a predetermined distance below said engaging edge;

said first safety mark defining the rearmost position to which said blade and said upwardly-extending portion can be safely worn provided that the engaging edge of the depth limiter has not been worn down to an elevation below said second safety mark whereby said marks provide positive visual indications to an operator when further use of the saw chain would be unsafe; and,

visual accentuating means formed on said safety marks for marking the same easily recognizable by the operator of the chain saw equipped with said saw chain.

4,554,854

AUTOMATIC RHYTHM PERFORMING APPARATUS

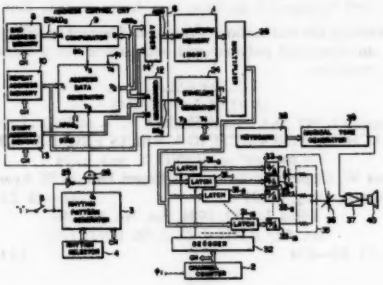
Mitsumi Kato, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 31, 1983, Ser. No. 546,892

Claims priority, application Japan, Nov. 8, 1982, 57-169087[U]

Int. Cl.[4] G10H *1/40*

U.S. Cl. 84—1.03 8 Claims



1. An automatic rhythm performing apparatus capable of producing a rhythmic tone corresponding to a single certain rhythmic musical instrument which is constituted by a plurality of distinct, constituent tone sources, comprising:

(a) a plurality of means each for producing a rhythmic tone signal corresponding respectively to each of said plurality of constituent tone sources of said single certain rhythmic musical instrument;

(b) means for individually controlling the signal levels of the respective rhythmic tone signals of said plurality of producing means;

(c) means for combining respective outputs of said plurality of producing means at signal levels controlled by said control means thereby to provide a combined signal corresponding to a rhythmic tone of said single certain rhythmic musical instrument;

(d) means for varying the signal level of said combined signal; and

(e) means for detecting the signal level of said combined signal,

wherein said control means controls the ratio of the signal levels of the respective rhythmic tone signals of said plurality of producing means in accordance with the detected signal level of said combined signal.

4,554,855

PARTIAL TIMBRE SOUND SYNTHESIS METHOD AND INSTRUMENT

Sydney A. Alonso, Stafford, and Cameron W. Jones, Wilder, both of Vt., assignors to New England Digital Corporation, White River Junction, Vt.

Continuation of Ser. No. 358,096, Mar. 15, 1982, abandoned, which is a continuation of Ser. No. 163,439, Jun. 7, 1980, abandoned. This application Jan. 24, 1984, Ser. No. 572,625

Int. Cl.[4] G10H *1/06*

U.S. Cl. 84—122 1 Claim

1. Apparatus for synthesis of acoustical notes in an electronic instrument, comprising:

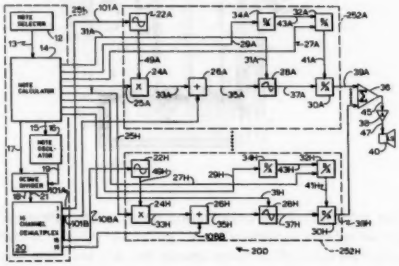
means for generating and storing in digital form a plurality of separate electrical signals each having components that can be selected by a user of the instrument from a plurality of fundamentals, harmonics. and non-harmonics independently of the other signals and each having parameters that can be adjusted by the user independently of the parameters of the other signals such that said signals,

when combined in analog form, have the pitch, loudness, and timbre characteristics of a designated note;

means controlled by the user for designating from a plurality of acoustical notes an acoustical note for synthesis;

means responsive to the selection of said note for reading out the stored signals; means for combining the read out signals; and

means for reproducing the combined signals acoustically to synthesize the selected note; said means for generating comprising a digital oscillator having clock means for generating pulses at a predetermined repetition rate, adder means having a first adder input and a second adder input respectively to receive a first binary input signal formed of binary bits having whole number significance and a second binary input signal formed of binary bits of fractional increment number significance, said adder means being



operable to add periodically the first binary input signal and the second binary input signal to produce a sum output and to produce a carry output whenever the capacity of the adder means is exceeded, selected binary bits of the fractional increment number being aligned within the adder means to have a lower order of significance than the bits forming the first binary input signal; accumulator means having an accumulator input and an accumulator output and connected to receive the clock pulses from the clock means and to receive the sum output at the accumulator input and operable to store the sum output and to provide the stored sum output at the accumulator output, the accumulator output being connected to provide the first binary signal input to the first adder input, so that an oscillator output is provided in the form of carry pulses having a rate proportional to the fractional increment number received by the second adder input.

4,554,856

MUSIC BOX WITH INDICATOR HOIST MECHANISM

Hiroshi Esaki, Tokyo, Japan, assignor to Kunio Kasai, Tokyo, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,123

Claims priority, application Japan, Jun. 1, 1983, 58-081872

Int. Cl.[4] G10F *1/06*

U.S. Cl. 84—95 C **8 Claims**

1. A music box with an indicator hoist mechanism, comprising:

a housing of said music box;

an upright pole attached to extend upright from said housing;

a powered rotatable shaft supported substantially within and by said housing;

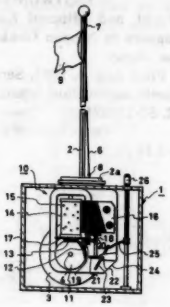
a pulley mounted on and rotatable with said shaft;

a string extending from said pulley, through an opening in said housing to an upper portion of said pole;

a rotating member provided with surface projections;

gear means for coupling together said shaft and said rotating member;

a vibration plate, portions of which are intermittently engaged by said projections as said rotating member rotates; and



an indicator attached to said string externally of said housing and moving with said string during rotation of said pulley.

4,554,857

ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF VARYING A TONE SYNTHESIS OPERATION ALGORITHM

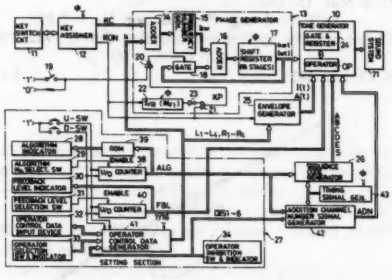
Tetsuo Nishimoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 31, 1983, Ser. No. 499,225

Claims priority, application Japan, Jun. 4, 1982, 57-94692

Int. Cl.[4] G10H *1/057, 7/00*

U.S. Cl. 84—1.19 **23 Claims**



1. An electronic musical instrument comprising:

a plurality of operation units respectively performing a predetermined waveform generation operation using a phase signal or a waveform signal applied to one or more inputs thereof as a parameter;

setting means for variably setting a combination of input and output connections between said respective operation units;

connection switching means for switching connections between said respective operation units in response to the combination of connections set by said setting means; and

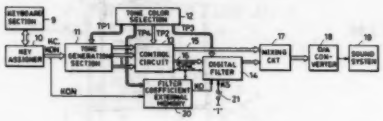
which further comprises indication means for visually indicating the combination of connections set by said setting means.

4,554,858

DIGITAL FILTER FOR AN ELECTRONIC MUSICAL INSTRUMENT

Masatada Wachi, and Mitsumi Katoh, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 4, 1983, Ser. No. 520,232
Claims priority, application Japan, Aug. 13, 1982, 57-140551; Sep. 14, 1982, 57-158871
Int. Cl.[4] G10H *1/12*
U.S. Cl. 84—1.19 20 Claims



1. A digital filter for an electronic musical instrument comprising:

A digital type pole filter capable of controlling a peak in an amplitude-frequency characteristic; and

a digital type zero filter coupled with said pole filter and capable of controlling a valley in an amplitude-frequency characteristic,

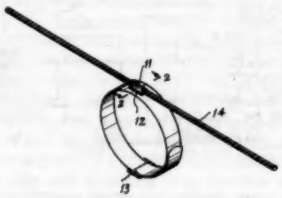
a digital tone signal being applied to said digital filter imparting the tone color determined by the amplitude frequency characteristics of both said pole filter and said zero filter.

4,554,859

BOW STROKE SIMULATOR

Leo D. V. Hanly, 30 Peebles Rd., Floreat Park, Western Australia, Australia

PCT No. PCT/AU83/00119, § 371 Date Apr. 27, 1984, § 102(e) Date Apr. 27, 1984, PCT Pub. No. WO84/01046, PCT Pub. Date Mar. 15, 1984
PCT Filed Aug. 29, 1983, Ser. No. 609,565
Claims priority, application Australia, Oct. 5, 1982, PF5586
Int. Cl.[4] G10G *7/00*
U.S. Cl. 84—283 6 Claims



1. A bow stroke simulator for a stringed musical instrument including a top plate supporting a finger board and a bridge, and strings interconnecting said bridge and said finger board and being spaced from said top plate, said bow stroke simulator comprising:

a short length of tube; and

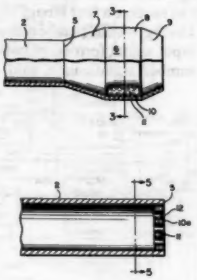
fastening means for fastening the tube to the top plate of said stringed musical instrument between said bridge and said finger board and below said strings with the longitudinal axis of the tube extending parallel to the longitudinal axis of the bridge, said tube being adapted to slidably receive a length of rod simulating a bow for the instrument.

4,554,860

PRESSURE DAMPER FOR RECOILLESS WEAPONS

Börje Johansson; Torbjörn Pramskog, both of Eskilstuna, and Jan-Erik Sandberg, Torshälla, all of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Oct. 20, 1982, Ser. No. 435,504
Claims priority, application Sweden, Oct. 21, 1981, 8106212
Int. Cl.[4] F41F *17/14, 17/12, 3/02*
U.S. Cl. 89—1.7 2 Claims



1. The combination of a pressure damper and a recoilless weapon having a barrel and a muzzle, the pressure damper designed to reduce the pressure in the area around and immediately to the rear of the muzzle of the barrel and comprising at least one container filled with a liquid which is so located in the muzzle region of the barrel that, when the recoilless weapon is fired, the at least one container bursts and as a result explosively releases the said liquid, so that said liquid is mixed with powder gases to reduce the pressure of the powder gases, said at least one container is cylindrically shaped and defines a plurality of apertures aligned parallel to a longitudinal axis of the barrel when said at least one container is located in the barrel, said plurality of apertures permitting gases to leak from the muzzle ahead of a projectile being fired from said barrel before said projectile reaches said at least one container to prevent bursting of the container by other than contacting said projectile.

2. The combination of a pressure damper and a recoilless weapon having a barrel and a muzzle, the pressure damper designed to reduce the pressure in the area around and immediately to the rear of the muzzle of the barrel and comprising at least one container filled with a liquid which is so located in the muzzle region of the barrel that, when the recoilless weapon is fired, the at least one container bursts and as a result explosively releases the said liquid, so that said liquid is mixed with powder gases to reduce the pressure of the powder gases, said barrel is of uniform diameter except for a forward extension section of the barrel which defines an enlargement that terminates at the muzzle, the muzzle having a diameter greater than the diameter of the barrel, the portion of the barrel extending from the uniform diameter portion being of conical shape tapered outwardly, the portion of the barrel extending from the muzzle being of conical shape and tapered outwardly, the two conical shaped portions being interconnected by a portion of cylindrical shape, said at least one container being in the form of a flattened toroid having a complementary shape to the cylindrical portion of the enlargement to fit snugly therein and having an opening diameter greater than the uniform diameter of the barrel.

4,554,861

PNEUMATIC NAILER

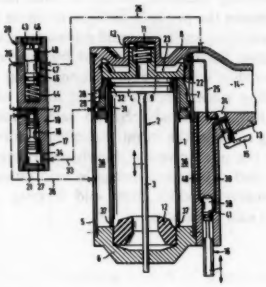
Theo Gassner, Triesenberg, Liechtenstein; Bruno Hann, Nenzing, Austria, and Edwin Kindle, Triesen, Liechtenstein, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jul. 21, 1983, Ser. No. 516,139

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1982, 3227855

Int. Cl.⁴ F15B *13/042*

U.S. Cl. 91—446 **5 Claims**



1. Pneumatic nailer using compressed air for drivihg nails comprises an axially extending closed working cylinder having a first end and a second end spaced apart in the axial direction, a drive piston slidably supported in said working cylinder for movement in a driving direction from the second end toward the first end of said working cylinder, means for forming a storage chamber, means forming a supply source for conveying compressed air into said working cylinder for driving said drive piston, said storage chamber being in communication with said working cylinder adjacent the first end thereof so that air compressed ahead of said drive piston as it moves in the driving direction toward said first end enters from said working cylinder into said storage chamber, duct means connecting said means forming a supply source to said storage chamber and said duct means forming an independent flow of the operating compressed air to said storage chamber from the flow supplied to said working cylinder for driving said drive piston, a valve unit located in said duct means between said supply source means and said storage chamber for controlling the flow of operating compressed air through said duct means from said supply source means into said storage chamber, and a switching element located in said duct means in the path of the operating compressed air flow to said valve unit and arranged to control the flow of operating compressed air to said valve unit so that when a predetermined operating compressed air pressure is exceeded flow of the operating compressed air to said valve unit is blocked by said switching element.

4,554,862

ROOF RIDGE VENTILATOR FOR RETARDING MICROBE GROWTH IN SHINGLE ROOFS

Clarke K. Wolfert, Peoria, Ill., assignor to Air Vent Inc., Peoria, Ill.

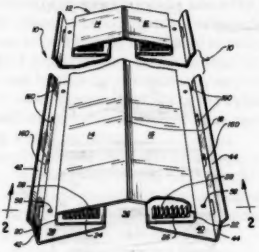
Filed Jun. 21, 1984, Ser. No. 623,092

Int. Cl.⁴ F24F *7/02*

U.S. Cl. 98—42.21 **4 Claims**

1. In a roof ridge ventilator adapted to be installed overlying the open ridge of and along the shingled roof of a building, said ventilator including a pair of flashing parts adapted to be anchored to the roof, and a pair of baffles each upstanding from the ends of one of the pair of flashing parts to which it is joined and spaced from the outer side walls of the ventilator,

the improvement comprising forming said ventilator essentially of zinc sheet metal, and providing at the juncture between said baffles and said flashing parts, a series of drain openings in a straight line along the horizontal extent of each said baffle, wherein the number and size of said drain openings is sufficient that moisture passing through the drain openings from the space between the



baffles and the outer side walls on each side of the ventilator will spread downwardly and diffuse outwardly, to form on the shingled roof a substantially uniform, single sheet of biostatic ionic zinc solution.

4,554,863

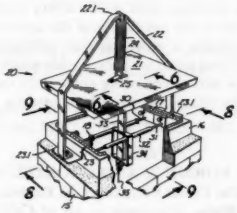
CHIMNEY DAMPER

Bernard L. Dalsin, Edina, Minn., assignor to Bernard Dalsin Manufacturing Company, Bloomington, Minn.

Filed May 7, 1984, Ser. No. 607,785

Int. Cl.⁴ F23L *17/10*

U.S. Cl. 98—59 **8 Claims**



1. A chimney damper attachable to a chimney flue having an upwardly facing, generally planar peripheral surface defining an upwardly open flue opening, comprising:

(a) a frame mountable to the open periphery of a chimney flue and having a superior portion oriented to extend above said flue opening;

(b) flue cover means comprising a thin, generally rectangular metal plate having a generally planar peripheral portion to seal against the upwardly facing surface of a flue opening;

(c) mounting means for mounting the flue cover means to the chimney flue;

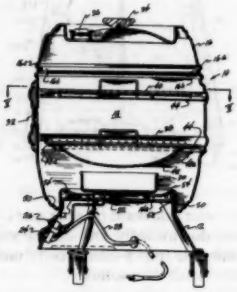
(d) spring means extending between the flue cover means and the superior portion of the frame for spring biasing the flue cover means upwardly away from the flue opening, the flue cover means serving to protect the spring means from heated gases emanating from the flue opening; and

(e) control means for urging the flue cover means downwardly, in opposition to the spring means, into sealing contact with a flue opening, the control means including lock means for maintaining the flue cover in its sealing position.

4,554,864
FOOD COOKER

Terry W. Smith, N. Miami Beach, Fla., and Timothy R. Fallon, Spartanburg, S.C., assignors to Draft Systems, Inc., Spartanburg, S.C.

Filed Jun. 8, 1984, Ser. No. 618,888
Int. Cl.[4] A47J 37/04
U.S. Cl. 99—340 9 Claims

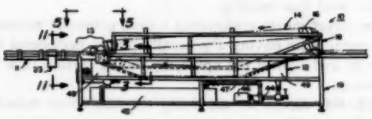


1. A food cooker comprising a support pedestal having an upper surface portion with periphery, a heating unit centrally mounted on the upper surface portion of the pedestal, an open-ended wall section removably supported with one open end on said pedestal and extending upwardly therefrom, a removable cover for closing the upper open end of the wall section and defining with the pedestal and wall section a cooking compartment, at least one food support grill located at an elevation within the cooking compartment, a pan having a periphery and located in the compartment below the grill and above the heating unit to catch and contain material falling from food on the grill during cooking, said wall section including a lower portion surrounding the periphery of the upper surface of the pedestal and defining a reservoir for collection of material falling into the lower portion of the cooking compartment, and said wall section and cover being separately removable from the pedestal to facilitate cleaning of the interior of the cooker.

4,554,865
TACO SHELL FORMING AND COOKING APPARATUS

Andrew A. Caridis, Foster City; Clark K. Benson, Millbrae, and Lawrence F. Klein, Hillsborough, all of Calif., assignors to Heat and Control, Inc., San Francisco, Calif.

Division of Ser. No. 332,743, Dec. 21, 1981, abandoned, which is a continuation of Ser. No. 578,323, Dec. 21, 1981, Pat. No. 4,510,165. This application Feb. 10, 1984, Ser. No. 578,319
Int. Cl.[4] A47J 37/12
U.S. Cl. 99—353 14 Claims

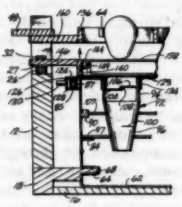


1. Apparatus for forming and cooking a food product comprising, a frame, means on said frame to contain a cooking medium through which such food product may be passed for cooking, endless conveyor means on said frame for carrying such food product through said cooking medium, a product forming station on said frame, means for conveying and positioning individual product pieces at said forming station, said conveyor means including a procession of product forming elements mounted thereon for motion between a closed nested position to an open position, each element having complementary convex and concave molding surfaces configurated so that when adjacent forming elements are disposed in a nesting relationship the mold surfaces are spaced apart such that the product interposed therein is restrained, shaped and carried thereby through the cooking medium, said conveyor means including means adjacent to said forming station serving to move the forming elements individually from the nested to the open position thus to present to such product positioned at said forming station said convex molding surface serving to urge such product towards said concave molding surface of the preceding forming element; means at said forming station serving to restrain the product movement on its path towards the concave molding surface, guide means co-acting with said conveyor means for maintaining said forming elements in a nested relationship when moving through said cooking medium, unloading station means on said frame, said conveyor means including means adjacent to said unloading station means serving to move the forming elements individually from the nested to the open position thereby exposing the product for removal, and supporting means at said unloading station serving to receive product from said forming elements for removal from said apparatus.

4,554,866
MECHANICAL EGG BREAKER AND SEPARATOR

Ernestine Hampton, 400 Mt. Washington Dr., Los Angeles, Calif. 90065

Filed Oct. 21, 1983, Ser. No. 544,222
Int. Cl.[4] A23J 1/09
U.S. Cl. 99—499 23 Claims



1. An apparatus for breaking eggs comprising:

egg-holding means for holding a plurality of eggs in an array;

egg-breaking means comprised of a plurality of knife means positioned beneath the egg-holding means, each knife means comprised of a pair of horizontally disposed, vertically oriented knife blades, said knife blades being movable between a first contiguous position and a second spaced-apart position, and movable vertically from a lower position spaced from eggs held by the egg-holding means to an upper position towards the egg-holding means to enable simultaneous breaking of the shells of a plurality of eggs held by the egg-holding means when the knife blades are in the first position, said knife blades having openings therein to allow substantially complete discharge of the contents of the eggs when the knife blades are moved to the second position and while in the upper position; and

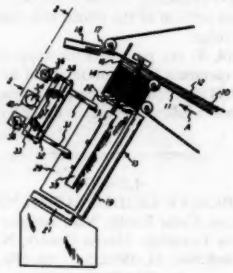
means for collecting the discharged contents of eggs broken by the knife means.

4,554,867

METHOD AND APPARATUS FOR HANDLING A STACK OF SHEETS

Klaus A. Thumm, Phillipsburg, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Mar. 19, 1984, Ser. No. 591,279
Int. Cl.[4] B65B *13/20*
U.S. Cl. 100—3 12 Claims



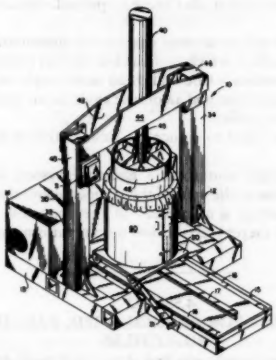
1. A method of handling a stack of sheets, comprising the steps of collecting the sheets into an inclined upright stack on its back on a stacker and on a first endboard, compressing the stack along its length and moving the stack sidewise off the stacker and while the stack is still compressed, supporting the stack and releasing stack compression and then placing a second endboard at the top of the stack while the stack is off the stacker, pressing the second endboard downwardly onto the stack, and again compressing the stack while binding the stack.

4,554,868

APPARATUS FOR COMPACTING REFUSE WITH STABILIZERS

John C. Zimmer, 502 Estate Dr., New Iberia, La. 70560

Filed Jan. 12, 1983, Ser. No. 457,429
Int. Cl.[4] B30B *15/06*
U.S. Cl. 100—229 R 6 Claims



1. A refuse compacting apparatus, comprising:

a. a frame, said frame providing a horizontal base and an upwardly extending superstructure, rigidly attached to said base;

b. a hydraulic cylinder having a movable driven ram portion and being mounted on said superstructure and being vertically oriented for extending said ram portion of said cylinder in a downward direction;

c. a compaction disk rigidly attached to a lower most end of said ram portion and being movable with said ram portion from an upper idle position to a lower operating position;

d. a movable compaction platform securedly mounted on said base beneath said cylinder during a compaction operation and slidably removable from said base during an unloading operation;

e. an open-ended cylindrical jacket assembly adapted to receive the refuse to be compacted, said jacket assembly being at least in part fixedly attachable to said compaction platform, said jacket having hinges at least on one side of a sidewall and latches on diametrically opposite side of a sidewall for assembling said jacket in the cylindrical operational position and disassembling it in an open-wall position during a non-operation;

f. a compaction container insertable inside said jacket assembly with an external wall of said container at least in part being contacted and supported against lateral movement and deformation by stabilizing means mounted on an interior wall of said jacet assembly;

said stabilizing means comprising a plurality of straps connected together in an open-frame manner and curved to follow cylindrical form of said jacket assembly and said compaction container;

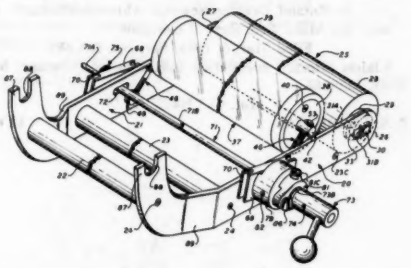
g. a runway portion extending outwardly from said frame to facilitate movement of said compaction platform and said jacket assembly attached thereto between an operating position when said platform is beneath said cylinder and a non-operating position laterally removed from said frame, said runway portion being provided with a pair of parallel spaced-apart rails and an I-beam fixedly attached midway betwen said rails, said platform being provided on its underside with a plurality of castors slidably engaging said rails and a t-shaped groove for slidable engagement with said I-beam of said runway portion, this combination of the rails, the castors, the I-beam and the groove facilitating back and forth movement of said platform along said runway.

4,554,869

AUXILIARY FORM ROLLER APPARATUS FOR ROTARY OFFSET LITHOGRAPHIC DUPLICATING MACHINES

Edward N. Ranno, Sr., 245 Ellen Dr., Park Ridge, N.J. 07656

Filed Mar. 1, 1984, Ser. No. 585,113
Int. Cl.[4] B41L *17/00*
U.S. Cl. 101—145 13 Claims



1. Auxiliary form roller apparatus for attachment to rotary offset lithographic duplicating machines of the type having a bed, a pair of spaced-apart main frame members extending upwardly and outwardly from the bed, a main frame support rod extending laterally between the frame members adjacent the tops thereof, a master cylinder and at least one machine form roller contacting the master cylinder at a first point on the periphery thereof, said apparatus comprising

an auxiliary form roller;

an auxiliary oscillator roller, said auxiliary oscillator roller

being oscillatable laterally along its axis of rotation in response to rotation thereof;

an auxiliary frame having

guide means at one end thereof adapted to pivotally engage the main frame support rod for support thereof,

first mounting means at the other end thereof for rotatably mounting said auxiliary form roller thereon, and

second mounting means disposed between the ends thereof for rotatably mounting said auxiliary oscillator roller thereon with the auxiliary oscillator roller in rolling contact with said auxiliary form roller; and

third mounting means disposed between the ends of said auxiliary frame for mounting said auxiliary frame on the main frame members with said guide means engaging the main frame support rod, said auxiliary form roller contacting the master cylinder at a second point on the periphery thereof which is spaced a peripheral distance from the first point and said auxiliary oscillator roller engaging the machine form roller, so that ink from the machine form roller is transferred to the master cylinder via said auxiliary oscillator roller and said auxiliary form roller,

said auxiliary frame comprising

a pair of arcuately-shaped spaced-apart support arms having an arcuate length substantially corresponding to the arcuate distance between the main frame support rod and said second point on the periphery of the master cylinder, and

support means extending laterally between said support arms for support thereof;

said guide means comprises a substantially U-shaped groove in one end of each of said support arms, said U-shaped groove pivotally engaging the main frame support rod; and

said first mounting means is disposed at the other end of each of said support arms;

said apparatus further comprising

control means disposed between said auxiliary frame and said third mounting means for causing relative movement therebetween, such that said support arms pivot about the longitudinal axis of the main frame support rod to thereby cause said auxiliary form roller to engage and disengage the master cylinder.

4,554,870

INK METERING DEVICE FOR A PRINTING MACHINE HAVING AN INK TROUGH-INK ROLLER COMBINATION

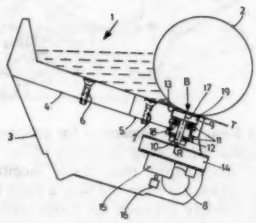
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,689

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308066

Int. Cl.⁴ B41F *31/12*

U.S. Cl. 101—365 **12 Claims**



1. In a printing machine, an ink metering device for an ink trough—ink roller combination of an inker, especially for an inker of a flat-bed or a high-pressure rotary printing machine, for controlling application of ink from the ink trough (**1**) to the ink roller (**2**) in axial zones having

a plurality of rotatable metering elements (**9**) which are located close to each other, and each extends over the width of an ink zone, wherein

said metering elements are formed as circular-cylindrical bodies, tangentially engageable against the ink roller (**2**);

each metering element (**9**) has an essentially planar end face which faces the ink roller (**2**), and at least one raised projection (**17**) extending across from one end portion to a second end portion of the planar end face and acting as a metering ridge;

and means (**4, 5**) are provided for supporting each of the metering elements for rotation about an axis of rotation (**R**) which is approximately perpendicular to a theoretical line which extends tangentially (**T**) with respect to the ink roller (**2**).

4,554,871

DISPENSED GUIDED SUBMUNITION

Richard G. Nixon, Cedar Knolls, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 21, 1983, Ser. No. 553,677

Int. Cl.⁴ F42B *13/50*

U.S. Cl. 102—489 **17 Claims**

1. Missile with a plurality of submunitions which are dispensed from the missile during the flight of the missile, wherein each submunition has a center axis, a forward end, and an aft end, said forward and aft ends defined by the general trajectory of the submunition after being dispensed, characterized in that:

said forward end on at least one of said submunitions has a forward surface which is slanted so that its relationship to that submunition's side wall is an acute angle on one side of the submunition and an obtuse angle on an opposite side of the submunition;

means are provided to induce the submunition to spin about its axis;

said submunition comprises a guidance system which includes a sensor, the spin of the projectile and the forward surface causing a movement of the projectile with the sensor and thereby establishes a scan pattern for the sensor.

4,554,872

ARRANGEMENT FOR REDUCING THE BASE DRAG IN PROJECTILES

Ulrich Schleicher, Hersbruck, Fed. Rep. of Germany, assignor to Diehl, GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,664

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246380

Int. Cl.⁴ F42B *13/00*

U.S. Cl. 102—490 **6 Claims**

1. An arrangement for reducing base drag of an artillery projectile comprising:

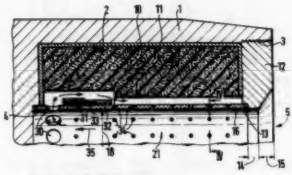
a body including an annular chamber and a discharge aperture in communication therewith;

an axially extending tube located in the chamber and separating the chamber into an outside region radially outside the tube and an inside region radially inside the tube, said inside region being in fluid communication with the discharge aperture; and

an annularly-shaped detonatable gas generating charge located in the outside region;

the tube including

(i) a plurality of inlet nozzles for conducting gas radially outward from the inside region to the outside region to detonate the gas generating charge, and



(ii) a plurality of outlet nozzles for conducting gas from the outside region into the inside region;

the tube restricting the flow of gas from the outside region to the inside region after detonation of the gas generating charge to facilitate maintaining a low pressure in said inside region;

further comprising flow control means connected to the tube and selectively opening and closing the inlet nozzles to control the flow of gas therethrough.

4,554,873

MATERIAL HANDLING AND SORTING SYSTEM

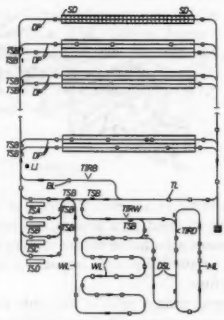
Michael P. Rex, Wimborne, England, assignor to Plessey Overseas Limited, Illford, England

Filed Sep. 3, 1982, Ser. No. 414,922

Claims priority, application United Kingdom, Sep. 4, 1981, 8126882

Int. Cl.[4] B61J *3/12*

U.S. Cl. 104—88 **17 Claims**



1. A material handling and sorting system comprising:

a tracking network including a plurality of loading and induction sidings and en-route track-side signpost means;

a plurality of destination paths including a plurality of associated discharge containers representing particular destinations;

a plurality of self-powered trolleys which co-operate with the tracking network and which are capable of carrying a particular material load requiring transportion to a particular destination, each trolley incorporating controllable steering means;

each induction siding incorporates an induction station, the induction station including input means arranged for entering coded data indicative of a particular destination into said induction stations, said coded data is transmitted from said induction stations to a central control system which is arranged to translate said coded data into routing data for programming a trolley;

an optical communication-channel is provided between the induction station and the trolley, said routing data being transferred to said trolley over said communication channel, said communication channel being a two-way channel comprising receiver/transmitter pairs incorporating photo-diodes and light-emitting diodes respectively which are optically coupled to optical sensor means on said trolley;

said signpost means includes signpost information with a serial data track and two clock-tracks, said serial data and clock tracks comprising physical bars mounted in apertures on a mounting plate wherein each bar is arranged to pass through an infra-red beam passing between a light emitting diode transmitter and photo-diode receiver in said optical sensor means thereby casting a shadow on said photo-diode to detect a signal; and

each said trolley incorporates a micro-processor and first and second data storage means, said routing data being entered in said first data storage means and a trolley operator program being stored in the second data storage means, wherein, upon the program being run, the routing data is compared with said signpost information read from said signpost means by said optical sensor means to control the trolley appropriately around the tracking network;

wherein the sorting system is so arranged that each trolley is programmed at any loading and induction siding with data relating to the route to be taken to a particular destination whereby the trolley so programmed co-operates with said en-route track-side signpost means thereby enabling the steering means to be controlled, to guide said relevant trolley through said tracking network and through its programmed destination, at which destination any accompanying material load is automatically discharged into the associated discharge container.

4,554,874

ROLLER GUIDE DEVICE FOR USE ON A VEHICLE

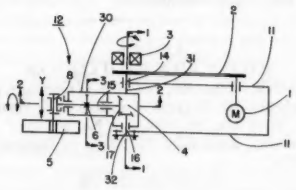
Hubert Thudt, Puchheim, Fed. Rep. of Germany, and Harald Winkler, Graz, Austria, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,801

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151410

Int. Cl.[4] B62D *1/26*; B61F *9/00*

U.S. Cl. 104—247 **8 Claims**



1. Roller guide for use on a vehicle; comprising a contact roller biased into contact with and rolling along a stationary guide track; including a roller retaining mechanism consisting of a retaining lever connected to the steering linkage of the vehicle and of a pivotable lever which is rotatable about its longitudinal centerline and is pivotally connected to a foward end of the retaining lever; the contact roller being freely rotat-

ably supported on the free end of said pivotable lever and the pivotable lever adapted to be pivoted from a retracted position in which it essentialy coincides with the axis of the retaining lever into an essentially straight-line operatively extended position; said pivotable lever including a pivotable shaft; a primary drive including a geared DC motor mounted on said retaining lever including a chain drive for actuating said pivotable shaft; a torque lock on said pivotable shaft for latching the pivotable lever in the retracted or the extreme extended positions and for unlatching the pivotable lever upon actuation of the primary drive.

4,554,875

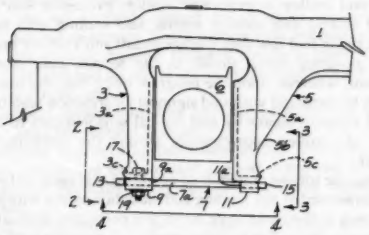
PEDESTAL TIE BAR ARRANGEMENT

Dallas L. Schmitt, Fairview Heights, and Kenneth E. Spencer, Granite City, both of Ill., assignors to Lukens General Industries, Inc., Coatesville, Pa.

Filed Jul. 23, 1984, Ser. No. 633,220

Int. Cl.[4] B61F *5/26*

U.S. Cl. 105—221 R **7 Claims**



1. In combination with a railway truck pedestal having longitudinally spaced vertical legs defining between them a vertical opening and terminating in downwardly facing horizontal feet, means on said pedestal legs forming separate longitudinally extending relatively wide and narrow apertures beneath the respective feet, said separate aperture-forming means being spaced from each other at least as far as the width of said opening in said pedestal, a pedestal tie bar slidably mounted in said apertures and extending across the opening in said pedestal and having a shank portion narrower than both of said apertures and permanently affixed enlarged end portions wider than said narrow aperture to prevent removal of said tie bar in either direction from said narrow aperture, said enlarged end portions forming transverse shoulders adjoining said shank, said wide aperture being wider than both said tie bar end portions to permit said tie bar to be moved longitudinally from its normal tying position across said opening in said pedestal to an open position clear of said opening in said pedestal, and removable means for retaining said tie bar in tying position across said opening in said pedestal.

4,554,876

ROTARY KILN WITH COOLER

Heinz Grachtrup, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

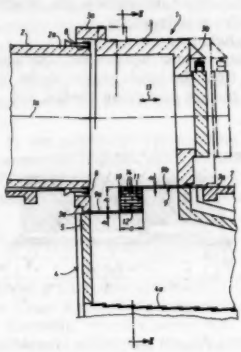
Filed Apr. 19, 1984, Ser. No. 602,051

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3316974

Int. Cl.[4] F23G *5/06*

U.S. Cl. 110—246 **8 Claims**

1. In a rotary kiln and cooler assembly having a rotatable cylinder, a stationary kiln outlet head associated with the outlet end of the cylinder and capable of limited displacement relative to the outlet end of the cylinder, and an inlet shaft connecting the kiln outlet head to the cooler, and wherein a sealable separating gap is provided at the connection between the kiln outlet head and the inlet shaft, the improvement wherein said kiln outlet head and said inlet shaft have side walls at said connection provided with approximately vertical interengaging steps of equal height, adjacent ones of said steps lying opposite one another and being movable toward and away from one another a distance to form a closable side



opening at each side of said kiln outlet head, and wherein the separating gap is divided by said steps into at least two horizontal sections of different heights which open into the side openings.

4,554,877

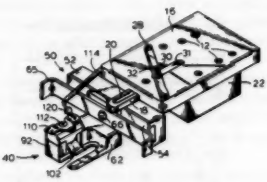
ALIGNMENT SYSTEM FOR A GARMENT ACCESSORY-HOLDING JIG

Salvatore V. Cusumano, Moscow, and Aaron Glassman, Scranton, both of Pa., assignors to P.S.R., Incorporated, Lake Ariel, Pa.

Continuation-in-part of Ser. No. 486,799, Apr. 20, 1983, Pat. No. 4,524,704. This application Dec. 6, 1984, Ser. No. 679,021

Int. Cl.[4] D05B *3/18*

U.S. Cl. 112—105 **15 Claims**



1. A jig for holding an accessory having at least two thread holes while being stitched on a sewing machine comprising:

attachment means attachable to the sewing machine in predetermined relationship with respect to the needle of the sewing machine;

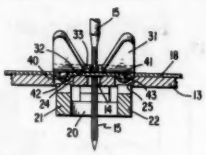
a first positioning means held in movable relationship with the attachment means; a holding means attached to and extending from the first positioning means to a location below the needle of the sewing machine, permituing the alignment of at least two thread holes on the accessory with the needle of the sewing machine when the first positioning means is moved to a desired location; and

an alignment system comprising a guide means affixed to the holding means and an indicator means, affixed to the attachment means, which is aligned with a desired location on the guide means in order to indicate alignment of the needle of the sewing machine with a desired location on said accessory, wherein the guide means is moved relative to the indicator means upon movement of the first positioning means.

4,554,878
SEWING MACHINE PRESSER DEVICE WITH FEED DRIFT CONTROL

Manfred R. Laidig, Whippany, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Dec. 10, 1984, Ser. No. 680,209
Int. Cl.[4] D05B 29/06
U.S. Cl. 112—235 8 Claims

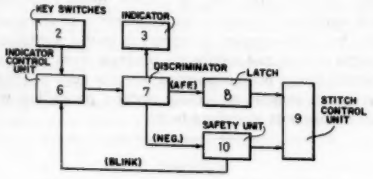


1. In a sewing machine having stitch forming mechanism including an endwise reciprocatory thread carrying needle, a work fabric supporting throat plate formed with an aperture accommodating passage of said thread carrying needle, a four-motion drop feed mechanism including a feed dog, said throat plate being formed with at least one feed dog accommodating slot, means actuating said feed dog to partake of work feed strokes in an extended position through said throat plate feed dog accommodating slot and return strokes in a retracted position within said throat plate feed dog accommodating slot, and a presser foot including a sole plate biased toward said throat plate for engaging a work fabric in opposition to said feed dog during said work feed strokes and for engaging a work fabric in opposition to said throat plate during said return strokes, said presser foot sole plate and said throat plate being formed one with a protruding rib and the other with recess aligned with and complemental to said rib, said rib acting to press a wale of work fabric into said recess only during each return stroke of said work feed dog.

4,554,879
ELECTRONIC SEWING MACHINE

Yasukata Eguchi, Tokyo, Japan, assignor to Janome Sewing Machine Industry Co. Ltd., Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,328
Claims priority, application Japan, Apr. 22, 1983, 58-70003
Int. Cl.[4] D05B 3/02, 35/12
U.S. Cl. 112—445 5 Claims



1. An electronic sewing machine comprising,

an electronic memory for storing stitch control data for a plurality of stitch patterns to be selectively and sequentially read out, to control the formation of a selected pattern by the sewing machine, each of said plurality of stitch patterns corresponding to a different pattern number to be indicated upon selection of a pattern by an operator;

selecting means for selecting a stitch pattern by designation of a pattern number, said selecting means including a plurality of operating switches;

digital indicator means for indicating said pattern number in the form of two digits when selected by operation of said operating switches of said selecting means;

discriminator means for detecting if said selected pattern number corresponds to a stitch pattern the control data for which is stored in said electronic memory, and for producing either an affirmative or a negative signal according to the detection result;

stitch control means coupled to said discriminator means and responsive to said affirmative signal, for controlling needle lateral amplitude and fabric feed amount in accordance with the selected pattern; and

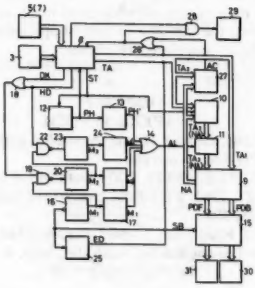
safety means coupled to said discriminator means, said digital indicator means and said stitch control means, and responsive to said negative signal to cause said digital indicator means to make a cautionary operation, and to cause said stitch control means to remain inoperative.

4,554,880
ELECTRONIC SEWING MACHINE

Takeshi Kongoh, Tokyo, Japan, assignor to Janome Sewing Machine Industry Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1984, Ser. No. 604,745
Claims priority, application Japan, Apr. 30, 1983, 58-74927
Int. Cl.[4] D05B 3/02
U.S. Cl. 112—454 4 Claims

SEÑOR



1. In an electronic sewing machine having an upper drive shaft and stitch forming instrumentalities operatively connected to the upper drive shaft and including a needle which is swingable transversely of a fabric feeding direction and is vertically reciprocated per rotation of the upper drive shaft to penetrate a fabric to form stitches thereon, and a fabric feeding device operated in timed relation with the needle to transport the fabric with respect to the needle, the improvement comprising, in combination,

a pulse generator operated in association with said upper drive shaft to produce a timing pulse per rotation of the upper drive shaft;

an electronic memory for storing at successive addresses stitch control data for controlling a needle position and a fabric feeding amount to produce a number of different stitch patterns, said stitch control data including data for producing stitches of different characters some of which require a supplemental mark to provide specific meaning to a word, data for providing a predetermined space between the characters to be stitched in sequence, data for producing stitches of the supplemental mark to be associated with a character, data for positioning the stitches of the supplemental mark with respect to the associated

character, and for discriminating the presence of said character requiring the supplemental mark to be stitched, said memory being responsive when addressed, to said timing pulse of said pulse generator to read out sequentially said stitch control data;

first switch means including a number of switches each selectively operated to produce a pattern signal to select a desired one of said patterns stored in said memory;

pattern signal control means responsive to said pattern signal to latch the same and for addressing said memory to read out the corresponding stitch control data;

second switch means alternatingly operated with said first stitch means to memorize in said pattern signal control means a desired number of pattern signals as selected by operation of said first switch means, wherein said pattern signal control means is operated to address said memory and adapted to produce an indicating signal during a stitching operation of the machine indicating the presence of a character requiring the supplemental mark to be subsequently stitched when the pattern signals of such a character are memorized;

discriminator means arranged to receive said stitch control data from said memory and to produce a discriminating signal; and

circuit means coupled to said discriminator means and said pattern signal control means, and responsive to said discriminating signal for designating the next address of said memory, said circuit means responsive to said indicating signal from said pattern signal control means immediately after issuance of said discriminating signal to produce a signal to designate the address immediately after said next address of said memory during one rotation of said upper drive shaft for reading out from said memory in combination the data of said supplemental mark and the data for positioning the stitches of said supplemental mark with respect to its associated character.

4,554,881

TRAPEZE SYSTEM

Leonard A. Lane, Lennox Heads, Australia, assignor to Illirrie Holdings Pty Ltd., Australia

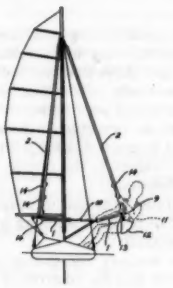
PCT No. PCT/AU82/00021, § 371 Date Oct. 27, 1982, § 102(e) Date Oct. 27, 1982, PCT Pub. No. WO82/03051, PCT Pub. Date Sep. 16, 1982

PCT Filed Mar. 3, 1982, Ser. No. 441,533

Claims priority, application Australia, Mar. 3, 1981, PE7818

Int. Cl.⁴ B63H *9/08*

U.S. Cl. 114—39 **14 Claims**



1. A trapeze system adapted for use on a sailing vessel having a substantially vertical mast, such trapeze system comprising a pair of substantially rigid hanging members connected at their upper extremities to an upper extremity of a mast in such a manner that the hanging members are respectively in port and starboard positions relative to the mast and each is capable of movement on its respective side of the mast, and means for releaseably connecting said hanging members to a trapeze harness.

4,554,882

FENDER SYSTEM

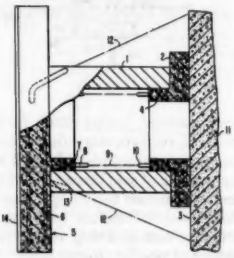
Rudolphus P. M. Lemmens, Dieren, Netherlands, assignor to Vredestein N.V., Velp, Netherlands

Filed Dec. 16, 1982, Ser. No. 450,411

Claims priority, application Netherlands, Dec. 23, 1981, 8105818

Int. Cl.⁴ B63B *21/00*

U.S. Cl. 114—219 **2 Claims**



1. A fender system for mounting on a quay or jetty comprising

at least one absorbing body of elastomer material adaptable for attachment to the quay or jetty,

a front plate which is parallel in essentially a vertical plane to a vertical wall of the quay or jetty attached to said absorbing body on its end away from the quay or jetty where it can come into touch with an object such as a ship moving towards the quay or jetty,

said front plate being made of cast reinforced concrete and being shaped and located for distributing and transferring the loads exerted by the object on the absorbing body,

at least one other part being connected with the cast reinforced concrete of said front plate by having a portion of said at least one other part cast in said reinforced concrete of said front plate,

one said parts being a gliding strip having a low friction coefficient of non-corrosive material with a back side connected to said front plate by a dove-tailed surface cast in the reinforced concrete of said front plate,

another of said parts being an anchor means embedded in said reinforced concrete for connection to the quay or jetty by a chain means to support at least a portion of the weight of said cast reinforced concrete front plate, and

a concrete flange plate connected with the quay or jetty and having an annular projecting portion projecting within said at least one absorbing body.

4,554,883

MODULAR FLOATING STRUCTURE

Wallace W. Lane, 579 Auwina Ave., Kailua, Hi. 96734

Filed Jun. 10, 1983, Ser. No. 503,038

Int. Cl.⁴ B63B *35/38*

U.S. Cl. 114—266 **19 Claims**

19. For use in a modular floating structure having a multiplicity of vertical support beams thereunder in a recirculated pattern, a submerged bridging network comprising:

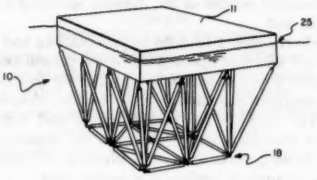
bridging beams arranged in an inverted pyramidal lattice;

bridging connectors for connecting said bridging beams to said support beams;

bottom beams forming a horizontal geometric lattice with intersections corresponding to the vertices of said bridging beam pyramidal lattices; and

bottom connectors for connecting said bottom beams to one another and to said bridging beams;

said bottom connectors including members aligned to connect both to bottom beams in a horizontal lattice and to bridging beams in said inverted pyramidal lattice;



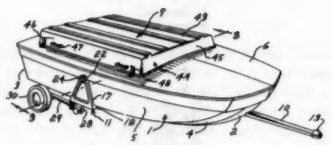
said bridging connectors including two members aligned to connect one submerged corner of a support beam to one bridging beam connected to a bottom connector.

4,554,884

TRAILER GEAR FOR SMALL CRAFT

Daniel Bouliane, 10,710 Olympia Blvd., Montreal, Canada (H2C 2W5)

Filed Mar. 8, 1984, Ser. No. 587,687
Int. Cl.⁴ B63B *7/02*
U.S. Cl. 114—344 **10 Claims**



1. A trailer gear for water craft, said craft including a hull having side walls, a bottom, a stern, a bow, and a generally horizontal and flat marginal portion formed between each said side wall and said bottom intermediate said stern and said bow, said trailer gear comprising a tow bar and two independent separate wheel assemblies, said tow bar being elongated and rigid, having one end adpated to be rigidly and detachably secured to the bow of said hull and having means at its opposite end for hitching the same to a towing vehicle, each of said wheel assemblies including a rigid frame conforming to the cross-sectional profile of each side wall, means to detachably secure each said frame to a respective side wall externally of said hull, each frame having a lower lateral flange adapted to underlap the said marginal portion of said hull and support the same thereat, a ground-engaging wheel and a spring suspension connecting said ground-engaging wheel to said frame in a nonadjustable manner whereby said wheels support said craft in upside-up position above ground level when said craft is being towed by a towing vehicle through said bar.

4,554,885

ROTATABLE FLAG SUPPORT

Camille J. Burny, Jr., 706 Waukegan Rd., Suite 7C, Glenview, Ill. 60025

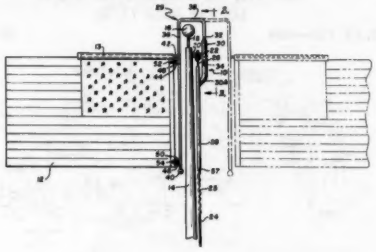
Filed Oct. 15, 1984, Ser. No. 660,649
Int. Cl.⁴ G09F *17/00*
U.S. Cl. 116—174 **13 Claims**

1. Apparatus for supporting a flag on a flagstaff to which is mounted a pulley and halyard combination for raising and lowering the flag, said apparatus comprising:

a coupling member coupled at a first end thereof to a first section of the halyard engaging the pulley;

an offset tubular sleeve coupled to said coupling member;

pivot means coupled to the flag and positioned within said offset tubular sleeve and extending along a portion of the length thereof and freely rotatable therein, said pivot means extending above and adapted to be positioned over the flagstaff with the flag in a fully raised position for maintaining the flag in spaced relation and downwind from the flagstaff; and



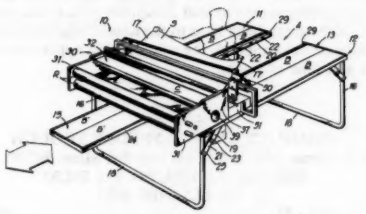
variable tension means coupling a second end of the coupling member to a second section of the halyard for applying increased tension to the halyard in orienting said pivot means generally vertically with the flag in the fully raised position and for reducing the tension applied to the halyard during the raising and lowering of the flag whereby said pivot means is maintained in spaced, offset relation from the flagstaff.

4,554,886

APPARATUS FOR COATING AND CUTTING SHEET MATERIAL

Carlos R. Carter, 6648 Wealthy Ct., Riverdale, Ga. 30274

Filed Feb. 27, 1984, Ser. No. 583,707
Int. Cl.⁴ B05C *3/18, 5/02*
U.S. Cl. 118—42 **9 Claims**



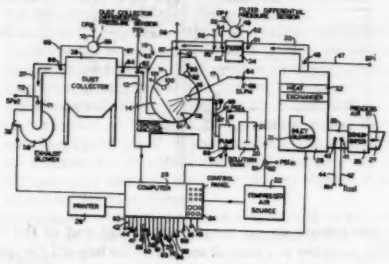
1. A machine for applying adhesive to a strip of wall covering material while the strip is being payed from a supply roll of the material to form a coated strip of desired length ready for hanging and for cutting such strip transversely to the desired length, said machine comprising a pair of elongate, generally horizontal and transversely spaced table portions defining an aisle into one end of which a person may enter to walk toward the opposite end of the aisle, support means adjacent said opposite end of the aisle for rotatably supporting a supply roll of wall covering material, means also adjacent said opposite end of the aisle for coating the upper side of said strip with adhesive as it is payed from the supply roll in response to a person grasping an end of the strip and transporting it while walking within the aisle toward said one end thereof, and movable table means bridging said aisle for allowing a person to enter the aisle and progress toward said opposite end thereof and for progessively filling in and bridging the aisle as a person progresses from said opposite end to and through said one end of the aisle.

4,554,887

APPARATUS FOR COATING TABLETS WITH COMPUTER CONTROL

David Yoakam; Robert Campbell, both of Cedar Rapids, and Robert Pehkonen, Lisbon, all of Iowa, assignors to Vector Corporation, Marion, Iowa

Filed May 22, 1984, Ser. No. 612,845
Int. Cl.[4] B05B *15/00*
U.S. Cl. 118—666 **10 Claims**



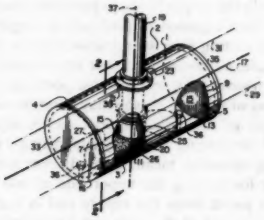
1. Apparatus for coating objects comprising, a machine with a rotating drum in which said objects to be coated are placed, drum driving means connected to said rotating drum, a spray head mounted in said rotating drum for supplying spray to said objects to be coated, air inlet means connected to said machine to supply inlet air to said drum, air outlet means connected to said machine to remove air from said drum, means for supplying spray to said spray head, a computer connected to supply inputs to control said drum driving means and said spray supplying means, and a plurality of sensors for detecting inlet air humidity, temperature and flow rate, drum air temperature and outlet air temperature connected to supply inputs to said inputs to said computer so that it can monitor and control said coating machine, and wherein said means for supplying spray to said spray head includes a fluid reservoir and a pump, said computer connected to control said pump and sensors for measuring pressure and quantity of said fluid supplied to said spray head supplying inputs to said computer so that said computer controls the spray head so as to the time of application of fluid, quantity of fluid applied, the rate of fluid applied to said objects, and time of drying.

4,554,888

COMPACT ANIMAL FEEDER TROUGH

Tony H. Gross, Rte. 1, Box 40, Hawley, Minn. 56549

Filed Mar. 21, 1984, Ser. No. 591,927
Int. Cl.[4] A01K *5/00*
U.S. Cl. 119—53 **10 Claims**



1. An animal feeding trough comprising, in combination, an elongate feeder housing with a longitudinal central axis, having a wall enclosing a feeding chamber, said housing having a top bounded by a top line and a bottom bounded by a bottom line, both lines being parallel to the central axis and lying in the same plane; the housing wall having a rounded front side and a rounded rear side opposite each other between the top and bottom boundary lines, said wall having a feed opening midway along the top boundary line and a pair of longitudinally spaced access openings in a sidewall defining a pair of feeding ports and providing feeding access to said chamber, said feeding ports having a lower edge above the chamber bottom so that the rounded bottom of the chamber serves as a feed holding trough; and

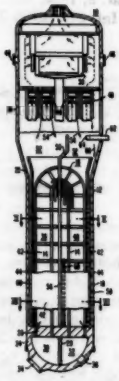
feed delivery means coupled to said housing and extending through said feed opening below the central axis a spaced distance above the chamber bottom for discharging animal feed into the middle of the feeding chamber trough midway between the feeding ports, said feed delivery means including barrier means in the chamber between said feeding ports to restrict physical or visual contact between animals feeding at adjacent ports.

4,554,889

HYBRID PREHEAT/RECIRCULATING STEAM GENERATOR

Gerard P. Lilly, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1984, Ser. No. 623,682
Int. Cl.[4] F22B *1/02*
U.S. Cl. 122—32 **4 Claims**



1. A vapor generator comprising:

a vertical shell portion;

a plurality of U-shaped tubes forming a tube bundle for transferring heat from a primary fluid to a secondary fluid, to vaporize said secondary fluid, said tube bundle being so disposed within said vapor generator that the primary fluid flows through the tubes to create a hot leg portion and a cold leg portion;

a tube sheet disposed adjacent to one end of said vertical shell portion, for receiving the ends of the tubes;

a wrapper, generally enclosing said tube bundle, and disposed within said shell portion to form an annular downcomer passage;

means for separating liquid from the vapor produced from said secondary fluid and for directing said separated liquid into said annular downcomer passage;

a divider plate extending longitudinally along said annular downcomer passage for dividing said annular downcomer passage into a first section adjacent to said cold leg portion of said tube bundle and a second section adjacent to said hot leg portion of said tube bundle; and

means for introducing feedwater into said first section of said downcomer passage, wherein said feedwater mixes with said separated liquid, said wrapper being cooperatively associated with said shell portion such that the mixture of

feedwater and separated liquid flows into said cold leg portion of said tube bundle;

wherein a top edge of said divider plate is offset toward said feedwater introducing means to limit the quantity of said separated liquid which mixes with said feedwater.

4,554,890

ENGINE INTAKE SYSTEM

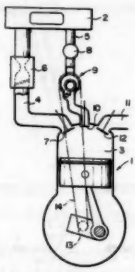
Haruo Okimoto, and Ikuo Matsuda, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 8, 1984, Ser. No. 638,686

Claims priority, application Japan, Aug. 10, 1983, 58-146848

Int. Cl.⁴ F02B *29/00, 33/00*

U.S. Cl. 123—26 **8 Claims**



1. An engine intake system including intake passage means, rotary type timing valve means located in said intake passage means and including rotatable means having inlet port means communicating with said intake passage means at an upstream portion of the intake passage means and outlet port means connected with said inlet port means through valve passage means formed in said rotatable means, means for rotating said rotatable means, said outlet port means being arranged so that it is cyclically communicated with said intake passage means at a downstream portion of the intake passage means as the rotatable means rotates, the improvement comprising passage port means provided in said downstream portion of the intake passage means for cooperation with said outlet port means in said rotatable means, said passage port means including at least two ports which are arranged so that one of the ports is communicated with said outlet port means in said rotatable means earlier than the other port, shut-off valve means provided in said one port and movable between a closed position and an open position, valve actuating means for actuating said shut-off valve means for changing opening period of said timing valve means.

4,554,891

COOLANT LEVEL CONTROL ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 26, 1984, Ser. No. 593,289

Claims priority, application Japan, Mar. 31, 1983, 58-53786

Int. Cl.⁴ F01P *3/22*

U.S. Cl. 123—41.21 **6 Claims**

1. In an internal combustion engine;

means defining a coolant jacket into which coolant is introduced in liquid form and discharged in gaseous form;

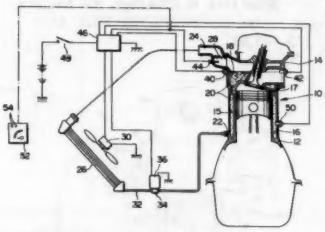
a pump for recirculating liquid coolant from a radiator into which gaseous coolant from said coolant jacket is introduced and condensed to a liquid form, to said coolant jacket;

a first level sensor disposed in said coolant jacket for detecting the presence of liquid coolant at a predetermined level therein;

a control circuit responsive to said level sensor for energizing said pump when said sensor indicates said level is below said predetermined one;

a low level sensor for sensing the presence of liquid coolant at a predetermined low level; and

a temperature sensor disposed in said coolant jacket for sensing the temperature prevailing in said coolant jacket at a level above said predetermined one,



said control circuit being responsive to said temperature sensor for energizing said pump in a manner to pump liquid coolant from said coolant jacket into said radiator until said low level sensor detects the absence of liquid coolant and maintains the level of liquid coolant at this level until said temperature sensor indicates the temperature of said engine has risen to a predetermined value.

4,554,892

WATER-COOLED DIESEL ENGINE FOR USE AS OUTBOARD ENGINE

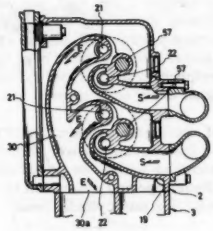
Koichi Amemori, and Toshihiko Kawabe, both of Takatsuki, Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Nov. 22, 1983, Ser. No. 554,403

Claims priority, application Japan, Jun. 21, 1983, 58-110190; Jun. 22, 1983, 58-111053; Jul. 26, 1983, 58-136526

Int. Cl.⁴ F01P *3/14, 3/16*

U.S. Cl. 123—41.82 R **6 Claims**



1. A water-cooled diesel engine for use as a marine outboard engine, including a cylinder block and a cylinder head formed as an integral unit from a lightweight alloy of aluminum and having a combustion chamber, a corner position of said combustion chamber formed by said cylinder block and said cylinder head being rounded to have an arcuate cross-section; at least one dry liner integrally cast in said cylinder block and provided with a honed inner peripheral surface, a radially outwardly recessed honing relief portion being formed in an end portion of said inner peripheral surface of said dry liner adjacent to the end of said combustion chamber, the end of said dry liner being positioned below said rounded corner portion of said combustion chamber and extending above the location of a top ring on a piston positioned at top dead center in said liner whereby honing of said cylinder block is avoided; and intake ports and exhaust ports formed in said cylinder head,

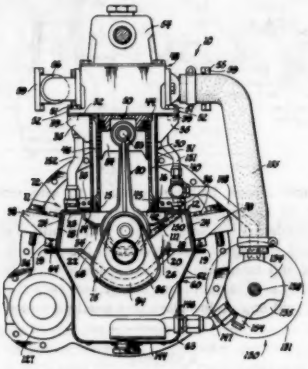
said exhaust ports being in communication with an exhaust manifold formed integrally with said cylinder block and said cylinder head.

4,554,893

LIGHTWEIGHT ENGINE

Anthony M. Vecellio, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1984, Ser. No. 656,519
Int. Cl.[4] F02F 7/00; F16C 3/10
U.S. Cl. 123—41.83 **12 Claims**



1. A lightweight internal combustion engine including a main cylinder and crankcase assembly having an open top closed by a cylinder head and a closed bottom, said main assembly comprising

a fabricated frame including a base member of stiff sheet material formed to define an upper crankcase wall having a plurality of longitudinally spaced upwardly flanged cylinder opening means each having an upper edge, a plurality of longitudinally spaced stiffening and crankshaft supporting webs formed of stiff sheet material and secured to said base member upper wall, said webs including main bearing opening means aligned longitudinally for rotatably supporting a crankshaft, and an upstanding continuous water jacket having a lower edge secured to said base member peripherally around said cylinder opening means and having an upper edge secured to said cylinder head, and

a plurality of removable cylinder liners within said water jacket, each liner having a lower portion sealingly engaging and extending within the upper edge of one of said flanged cylinder opening means and having an upper end sealingly engaging said cylinder head.

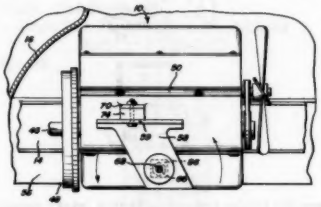
4,554,894

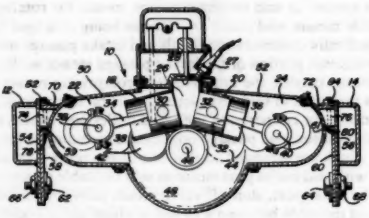
TWIN PISTON-PER-CYLINDER ENGINE

Wilfred B. Johnson, Star Rte., Box 3289A, Manistique, Mich. 49854

Filed Nov. 2, 1983, Ser. No. 548,975
Int. Cl.[4] F02B 25/12
U.S. Cl. 123—53 AA **2 Claims**

1. In an internal combustion engine comprising opposed cylinders defining a common centrally disposed combustion chamber therebetween, the improvement wherein the cylinders are mutually inclined to define a substantially V-shaped combustion chamber when pistons associated the respective cylinders are at their top dead center positions, the engine including crank shafts for the respective pistons located outwardly of the cylinders by a distance sufficient to allow the pistons and connecting rods when disconnected from the crank shafts to be withdrawn from the bottoms of the respective cylinders without interference from the crank shafts, wherein the cylinders are substantially horizontally opposed, wherein the engine includes removable crank case covers at the top of the engine for obtaining access to the pistons and connecting rods and for removal thereof, wherein the engine includes a mounting bracket on each side for providing 2-point mounting of the engine in a vehicle engine compartment in a manner promoting pivoting of the engine in the event of a collision rather than projecting the engine against a fire wall of the vehicle, wherein each mounting bracket includes a generally vertically extending bracket member having its upper end attached to the side of an engine intermediate the ends thereof with the lower end of the bracket member depending from the point of attachment with the engine, and a vertically extending support member attached to a vehicle frame at its upper end and depending alongside said bracket member, and means securing the bracket member and support member together to





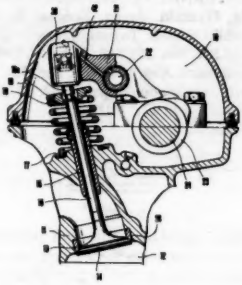
enable pivotal movement about a transverse axis upon application of force to the forward end of the engine above the transverse axis as would occur in the event the front end of the vehicle collided with another vehicle or a stationary object, wherein said means pivotally connecting the bracket member and support member includes a pivot bolt and a shim member interconnected the bracket member and support member to prevent pivotal movement of the engine until predetermined force has been applied to the engine sufficient to rupture the shear member after which the engine may pivot about a transverse axis defined by the bolt, and wherein said shear member is a polygonal projection rigidly affixed to the bracket member, said support member including a correspondingly shaped recess receiving the projection, said projection and recess being concentrically arranged with respect to the pivot bolt to prevent rotational movement of the bracket member and engine with respect to the support member until the polygonal projection has been broken away from the bracket member.

4,554,895

HYDRAULIC LIFTER FOR INTERNAL COMBUSTION ENGINES

Takuro Ono, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 8, 1984, Ser. No. 578,095
Claims priority, application Japan, Feb. 17, 1983, 58-25951
Int. Cl.[4] F01L 1/24
U.S. Cl. 123—90.55 1 Claim



1. A hydraulic lifter for internal combustion engines, comprising:

a valve train including a rotation cam, a rocker arm and a valve stem, said rocker arm receiving the load from said rotating cam by one end and operating said valve stem by the other end;

a cylinder formed as an open-lower-end hole in said one end of said rocker arm;

a plunger slidably inserted into the lower portion of said cylinder and contacting an upper end of said valve stem;

valve means arranged in said cylinder and dividing the internal space of said cylinder into a pressure chamber of the lower portion and an oil reservoir chamber of the upper portion, said valve means including means for allowing said oil to flow from said reservoir chamber into said pressure chamber;

a spring positioned within said pressure chamber and biasing said plunger to said valve stem; and

oil inlet means opened at the upper end portion of said reservoir chamber.

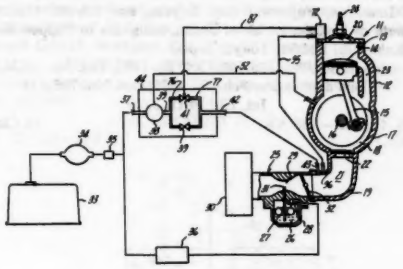
4,554,896

FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masafumi Sougawa, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Apr. 22, 1983, Ser. No. 487,697
Claims priority, application Japan, May 1, 1982, 57-72573
Int. Cl.[4] F02M 1/16
U.S. Cl. 123—179 G 17 Claims

1. A cold enrichment device for an internal combustion engine comprising a charge forming device having a main nozzle for delivering a fuel/air mixture to said engine for running, a fuel pump, a discharge nozzle downstream of said main nozzle, means responsive to starting of the engine for delivering fuel under pressure from said fuel pump to said discharge nozzle for a predetermined period of time for starting enrichment, and temperature responsive means for delivering fuel under pressure from said fuel pump to said discharge nozzle independently of said charge forming device when the



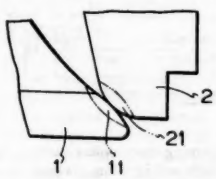
temperature of the engine is below a predetermined amount for cold running enrichment.

4,554,897

EXHAUST VALVE FOR DIESEL ENGINE AND PRODUCTION THEREOF

Takemi Yamada, Tokyo; Tamataro Satoh, Yokohama; Masaaki Mizushina, Fujisawa; Koji Toyota, and Hiromi Okamoto, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 315,666, Oct. 28, 1981, Pat. No. 4,530,322.
This application Feb. 25, 1985, Ser. No. 705,216
Claims priority, application Japan, Oct. 31, 1980, 55-152264; Sep. 24, 1981, 56-149620
Int. Cl.[4] F01L 3/04
U.S. Cl. 123—188 AA 15 Claims



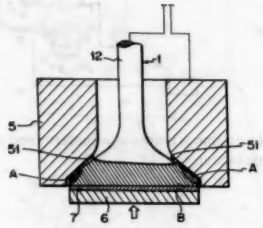
1. Exhaust valve for Diesel engine, wherein a seat face thereof is formed with at least one coated layer comprising ceramics and metals, the coated layer increasing substantially constantly in density of said ceramics towards an upper surface thereof, wherein the coated layer comprises ceramics at an uppermost layer.

3. Exhaust valve for Diesel engine, wherein a seat face thereof is formed with at least one coated layer comprising ceramics and metals, the coated layer increasing substantially constantly in density of said ceramics towards an upper surface thereof, wherein the coated layer comprises a ceramic and metal complex layer at an uppermost layer.

4,554,898
EXHAUST VALVE FOR DIESEL ENGINE AND PRODUCTION THEREOF

Takemi Yamada, Tokyo; Tamataro Satoh, Yokohama; Masaaki Mizushina, Fujisawa; Koji Toyota, and Hiromi Okamoto, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 315,666, Oct. 28, 1981, Pat. No. 4,530,322.
This application Feb. 25, 1985, Ser. No. 705,323
Int. Cl.⁴ F01L 3/04
U.S. Cl. 123—188 AA 16 Claims

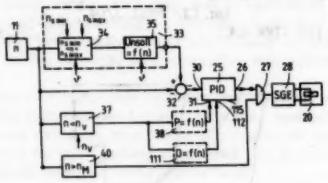


1. An exhaust valve for a Diesel engine, wherein a seat face thereof is formed with coated layer comprising ceramic and metal, the coated layer increasing in density of ceramic toward an upper surface thereof, wherein the coated layer comprises a plurality of layers which each vary in ceramic density.

4,554,899
SPEED GOVERNING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH SELF-IGNITION

Gerhard Engel, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,552
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329800
Int. Cl.⁴ F02M 39/00
U.S. Cl. 123—357 16 Claims



1. A speed governing electronic system for an internal combustion engine with self-ignition, having an electromagnetic final control element affecting the quantity of fuel to be injected and having a control unit for forming the control signal for said final control element by means of a governor amplifier having PID behavior and further in accordance with the deviation of an actual rpm value from a set-point rpm value, wherein said set-point value which is raised with the rpm, after a threshold has been exceeded, only drops in a delayed manner upon an ensuing abrupt drop in rpm, and wherein upon a drop below a predetermined value dependent on said actual value, a nonlinear elevation of the component of the amplification of said governor amplifier can take place, said governor amplifier having means combining at least one of

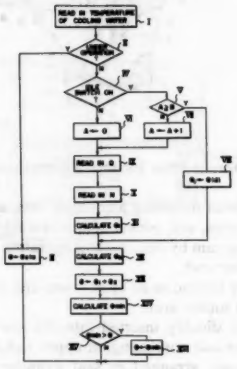
(1) a means defining a high dynamic amplification behavior in the range of the drop of the engine rpm, and a means defining a flattened characteristic curve in the vicinity of at least one of the ends of the regulated range of said governor amplifier from a threshold value on, and

(2) a means defining a dynamic amplification dropping from a higher value to a lower value in the range of an undercutting of an engine drop of rpm caused by cold starting of the engine.

4,554,900
METHOD FOR CONTROLLING IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Takao Komoda, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 361,788, Mar. 25, 1982, abandoned.
This application Aug. 13, 1984, Ser. No. 640,220
Claims priority, application Japan, Nov. 20, 1981, 56-186328
Int. Cl.⁴ F02P 5/08
U.S. Cl. 123—418 13 Claims



2. A method for controlling ignition timing of an internal combustion engine using an electronic ignition timing control apparatus, comprising the steps of:

setting ignition timing to an appropriate value in a loaded operation in accordance with the amount of intake air flow and the rotational speed of the engine;

setting ignition timing in an idling operation to an idling operation value retarded with respect to the value in the loaded operation irrespective of the amount of intake air flow; and

setting ignition timing at a transition from loaded operation to idling operation to said idling operation value after an invariable delay time has elapsed since the start of the idling operation.

4,554,901
FLUID DISTRIBUTING APPARATUS

Dennis H. Gibson, Edelstein; Alan R. Stockner, Chillicothe, and Donald J. Waldman, Brimfield, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 27, 1984, Ser. No. 594,040
Int. Cl.⁴ F02M 41/06
U.S. Cl. 123—450 7 Claims

1. A fluid distributing apparatus, comprising:

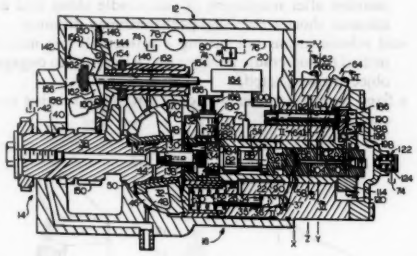
a housing defining a bore, a pumping chamber, and a low pressure fluid inlet passage communicating with the bore;

a piston reciprocatingly disposed within said pumping chamber for movement in one direction to provide an intake stroke and movement in a second direction to provide a pressure stroke;

a rotor having a fluid passageway defined therein, said passageway having a portion thereof in communication with

a peripheral surface of said rotor, said rotor being rotatably disposed within said bore;

a single, dual flow delivery passage communicating the pumping chamber with the bore and being in alternate communication with the low pressure fluid inlet passage and the fluid passageway in the rotor; and



means for directing fluid from said single, dual flow delivery passage to the first radial ports to minimize directional changes of fluid, said directing means opening onto the peripheral surface of the rotor and includes a relief positioned on the leading edge of the opening to intersect the opening at an acute angle with respect to the peripheral surface of the rotor.

4,554,902

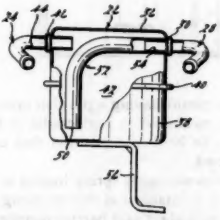
FUEL CONDITIONING DEVICE

Walter J. Atkins, Wayne, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 21, 1984, Ser. No. 622,910

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—557 **3 Claims**



1. In a vehicle with a carbureted internal combustion engine positioned within a substantially enclosed engine compartment, the upper walled surface of which is defined by an engine compartment hood means, the compartment characterized by limited air circulation through the engine compartment for cooling when a hot engine is de-energized resulting in a high engine compartment temperature increase, wherein the improvement comprises a fuel heat conditioning device and system for restarting the engine, comprising:

a source of liquid fuel including a carburetor bowl within the engine compartment and a fuel tank outside the engine compartment and a fuel line extending therebetween;

a hollow, thin-walled enclosure means within the engine compartment having a sufficient volume for engine starting and located beneath the upper walled surface of the hood means and adjacent the engine carburetor, the fuel passing through said fuel line and said enclosure being heated by no other heat source other than the air circulating in the engine compartment.

4,554,903

FUEL INJECTION APPARATUS FOR INJECTING A FUEL MIXTURE COMPRISING AT LEAST TWO COMPONENTS

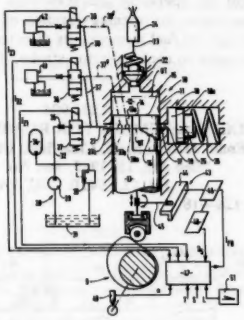
Max Straubel, Stuttgart, and Klaus-Dieter Zimmermann, Vaihingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 2, 1984, Ser. No. 585,464

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3310049

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—575 **6 Claims**



1. A fuel injection apparatus for injecting a fuel mixture comprising at least two components, wherein at least one additional fluid or additional fuel is admixed with a main fuel to a desired ratio,

an electrical control unit;

at least one pump piston having a longitudinal axis, said pump piston is guided in a pump cylinder of a fuel injection pump, acts upon a pump work chamber between said piston and a fuel supply pressure valve, and said piston is linearly actuatable by a cam drive along said longitudinal axis;

a first metering valve delivering a main fuel via a first inflow conduit, the opening duration of which said first inflow valve determines the quantity of the main fuel pre-stored in the pump work chamber;

at least one second metering valve supplying the pump work chamber with an additional fluid, which said second metering valve is inserted in a second inflow conduit and enables the flow of the additional fluid admixed with the main fluid;

said pump piston is rotatable by means of an adjusting device that serves to shift the instant of supply onset and that is provided with an electromechanical adjusting member that is triggerable by the electrical control unit, said pump piston has a first control edge formed by its end face oriented toward the pump work chamber and a second control edge inclined relative to the longitudinal axis of the pump piston for determining the end of supply; by means of said second control edge, an overflow opening of an overflow conduit leading to a fuel reservoir is openable, and that the fuel reservoir is embodied as a refill reservoir receiving the entire return-flow fuel quantity diverted after the end of supply and returning the fuel to the pump work chamber prior to the next subsequent supply stroke, said reservoir including a reservoir piston, said reservoir piston including a bottom facing toward said pump work chamber when in its non-displaced position filling an end portion of said reservoir facing said pump work chamber, and wherein the overflow conduit represents the sole and direct connection between the refill reservoir and the pump work chamber and the overflow opening located at the mouth of the overflow con-

duit into the pump work chamber is openable by both control edges of the pump piston;

said fuel supply pressure valve being inserted into a pressure line connecting the pump work chamber with an injection nozzle;

in which the pump work chamber is exclusively embodied by a section of the pump cylinder defined on the supply side by the pressure valve and on the drive side by the pump piston, to which chamber at least one of the inflow conduits is directly connected, that the at least two metering valves inserted into separate inflow conduits are electromechanically actuatable, and said electrical control unit emits control pulses (I_{z1}, I_{z2}, I_{z3}) dependent on operating characteristics (n, T, S, L) to the metering valves, the opening duration of which fixes the mixture ratio of the fuel components directed to the pump work chamber prior to each injection stroke of the pump piston.

4,554,904

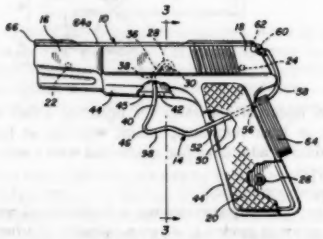
TRIGGER ASSEMBLY FOR RUBBER BAND GUN

Mitsuo Endo, 1120 S. State, Clearfield, Utah 84015

Filed Jan. 15, 1985, Ser. No. 692,070

Int. Cl.[4] F41B *7/02, 7/08*

U.S. Cl. 124—18 **10 Claims**



8. A toy rubber band gun comprising a gun body defining an imitation barrel, a stock at the back of the barrel, and a handle depending from the stock, the gun further including a trigger element of elongate resilient material having a forward end formed as an eye secured on a pin in the stock of the gun, a trigger portion extending downwardly through a slot in the bottom of the stock for accommodating back and forth movement of the trigger portion, an elongate portion extending rearwardly from the trigger portion through a further slot in the front of the handle for accommodating up and down movement of the elongate portion up through the handle and out through a slide bearing in back of the handle for accommodating lengthwise movement of the elongate portion, and a loop portion extending upwardly from the elongate portion behind the handle and terminating in a hooked tip biased into engagement against the back of the stock whereby rearward pressure on the trigger portion of the trigger element disengages the hooked tip from the back of the stock and release of said rearward pressure on the trigger portion reengages the hooked tip with the back of the stock.

4,554,905

SPACE PROBE/SATELLITE EJECTION APPARATUS FOR SPACECRAFT

Harold M. Smyly; Charles D. Miller; Richard A. Cloyd, and Clarence Heller, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Wshington, D.C.

Filed Apr. 5, 1984, Ser. No. 596,959

Int. Cl.[4] B64G *1/64;* **F41B** *7/00*

U.S. Cl. 124—56 **7 Claims**

5. An apparatus for ejecting an object, comprising:

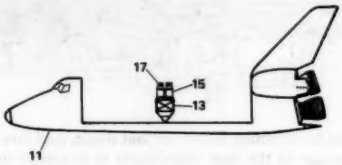
a cradle member adapted to support thereon the object to be ejected,

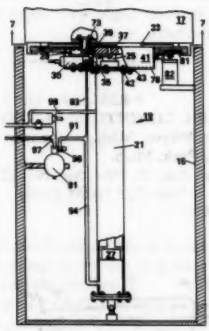
means for quickly moving said cradle member from a nested position a predetermined distance along an axis, and then stopping so said object thereon will continue to move outwardly from said cradle member,

release mechanism for holding said object to said cradle member and for releasing said object from said cradle member after movement of said cradle along said axis a distance shorter than said predetermined distance,

said release means comprising a retractable pin means attached to said cradle member that is adapted to engage the object to be ejected,

a fixed barrier member that does not move relative to said cradle member,





said retractable pin means having a pin that contacts at one end said barrier means when said cradle is in a nested position so as to be held in a position that engages the object to be ejected,

said retractable pin means being spring loaded so when said cradle to which it is attached is moved along said axis a short distance it will clear said barrier member and snap back disengaging from the object and thus allow it to move outwardly from said cradle member,

means for rotating said cradle member,

said barrier member being circular so the pin of said retractable pin means will continually contact it as said cradle member rotates until such time it is moved along said axis a sufficient distance to clear the barrier member.

4,554,906

TANKLESS FRICTION BOILER SYSTEM

William E. Newman, Sr., 207 Doncaster Rd., Joppa, Md. 21085, and Desmond J. Farrow, Sr., 546 Mechanics Valley Rd., North East, Md. 21901

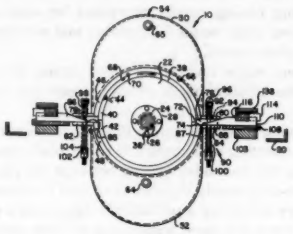
Filed Oct. 12, 1984, Ser. No. 660,525

Int. Cl.[4] F22B *3/06*

U.S. Cl. 122—26 **13 Claims**

1. In a system for heating fluent material by heat caused by the biased contact of a rotor and and assembly fixed relative thereto; the improvement comprising: the rotor being cylindri-

cal, the fixed assmebly including: a first member with a hemi-cylindrical bore portion, a second member with a hemi-cylindrical bore portion and a plurality of elements for adjustably holding the first member relative to the second member, said plurality of elements compensating for wear caused by frictional contact between the rotor and the first and second hemi-cylindrical bore portions by resiliently suspending the second



member below the first member with the hemi-cylindrical bore portions opposed to form a substantially cylindrical bore and causing said hemi-cylindrical bore portions to be urged toward said rotor, means for rotating the rotor in the substantially cylindrical bore in contact with the first and second members, means affixing said assembly against rotation, and means associated with the first and second member for exposing fluid for heating by said assembly.

4,554,907

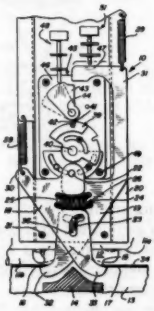
LATCH FOR SELF-CLEANING OVEN DOOR

Ronald V. Overley, Bloomfield Township, Morrow County; Michael H. Tedhams, Columbus, and Carl L. Atzbach, Pleasant Township, Hardin County, all of Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 12, 1983, Ser. No. 560,856

Int. Cl.[4] F23M *7/00*; E05C *7/00*

U.S. Cl. 126—191 **18 Claims**



1. In a self-cleaning oven structure having wall means defining an oven cavity and a door movably mounted to said wall means for selectively closing said cavity in a closed position thereof, an improved latching and locking device for maintaining the door releasably in said closed position, comprising:

a pair of latch arms each having a distal portion, and defining overlapping, divergent kidney-shaped slots;

pivot means for pivotally mounting said latch arms on said wall means in a scissorlike arrangement, said distal portions of the latch arms defining a pair of selectively positionable latch bolts;

means on said door defining an opening having a pair of catches at spaced portions thereof disposed to be engaged by said latch bolts as an incident of said latch arms being projected through said opening while in a closed arrangement and said latch bolts being urged apart into juxtaposition with said catches in an opened arrangement;

means biasing said latch arms to said closed arrangement;

means including a guide pin on said wall means extending through said overlapping slots and means on the door for urging said latch arms to said opened arrangement as a result of the projection of said latch arms through said opening, said latching and locking device being free of overcenter means; and

locking means for locking said latch arms in said opened arrangement in engagement with said catches to define means for mounting the door in said closed position as an incident of said oven cavity being heated to a preselected high temperature with said door in said closed position, whereby said door may be effectively releasably latched and locked in said closed position during operation of the oven structure.

4,554,908

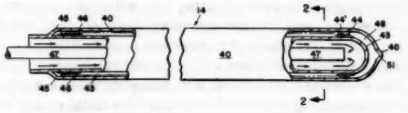
ELECTROMAGNETIC ENERGY ABSORBER

Jacques M. Hanlet, Lake Worth, and Elia R. J. Tarantino, Palm Beach, both of Fla., assignors to Alpha-Omega Development Inc., Loxahatchee, Fla.

Continuation of Ser. No. 70,606, Aug. 29, 1979, abandoned. This application Jul. 26, 1984, Ser. No. 634,827

Int. Cl.[4] F23J *3/02*

U.S. Cl. 126—443 **6 Claims**



1. An energy absorber system for heating fluid therein responsive to impingement by energy within the electromagnetic spectrum, comprising:

(a) a rigid outer tube member substantially transparent to predetermined bandwidths within said electromagnetic spectrum, said outer tube member having an outer tube member axis line;

(b) a first inner tube member containing said fluid to be heated, being mounted internal said outer tube member substantially coincident with said outer tube member axis line, said outer and first inner tube members being spaced each from the other defining an evacuated chamber therebetween, said first inner tube member having grooves formed on an external surface thereof, and a substantially smooth inner surface for providing substantially linearly directed fluid flow in said axis line direction, said grooves defining an included angle within the approximate range between 3.0° to 30.0°, said grooves having a metallic coating formed thereon adapted to provide a plurality of reflections of said energy within said grooves; and,

(c) a second inner tube member mounted internal said first inner tube member, said first and second inner tube members being spaced each from the other, said fluid to be heated entering said energy absorber system within an annular space defined by said substantially smooth inner surface of said first inner tube member and a substantially smooth external surface of said second inner tube member between said first and second inner tube members and exiting through said second inner tube member in a linearly directed manner.

4,554,909
VAGINAL APPLICATOR

Jose L. Pino y Torres, 918 Versailles Cir., Maitland, Fla. 32751

Filed May 27, 1983, Ser. No. 498,919
Int. Cl.[4] A61J 1/00
U.S. Cl. 128—1.2 16 Claims

1. An instrument for irradiative treatment of the genital tract, comprising:

an elongated uterovaginal tandem having a curved proximal end, and a distal end;

an enlarged intravaginal applicator elongated in a dimension of elongation, and a tandem-receiving bore formed therein along said dimension of elongation, said applicator also including a proximal end, a distal end, an anterior portion and a posterior portion;

means for operatively interconnecting said tandem and said intravaginal applicator during use with said tandem received by said tandem-receiving bore so that relative rotational movement therebetween is prevented;

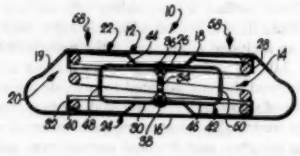
means defining at least one cavity in said applicator adjacent the proximal end thereof, and means defining a passageway extending from said cavity to the distal end of said applicator, said passageway and cavity for receipt of a container of irradiative treatment material; and

means defining suture receiving openings at said distal end of said intravaginal applicator.

4,554,910
CARDIO PULMONARY RESUSCITATION PRESSURE INDICATOR

James J. Lally, Shawnee Mission, Kans., assignor to Health Education Publication Company, Inc., Kansas City, Mo.

Filed Feb. 28, 1983, Ser. No. 470,609
Int. Cl.[4] A61H 31/00
U.S. Cl. 128—28 7 Claims



1. A cardio pulmonary resuscitation pressure indicator comprising:

force-transmitting structure including a first surface for placement on a patient's chest region, a second surface for engagement by the hands of a person treating said patient, and means for transmitting force applied by said person through said first surface to the chest region of said patient,

said force-transmitting means being positioned between said first and second surface and comprising upper and lower plate means oriented in an opposed, spaced apart relationship and means operably coupling said upper and lower plate means for movement of the upper plate means relative to the lower plate means when said force is applied, including biasing means interposed between said upper and lower plate means for resisting said movement of said upper plate means,

said biasing means comprising a coil spring in engagement with the adjacent faces of said upper and lower plate means,

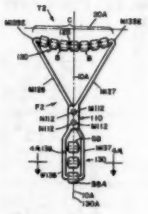
said coupling means including flexible connector means for interconnecting said upper and lower plate means and for limiting the maximum spacing between the plates; and

signal means operably coupled with said force-transmitting structure for giving a perceptible signal when a predetermined force has been transmitted to said patient's chest region.

4,554,911
MASSAGING TOOL AND METHOD FOR LOWER-EYELIDS AND ZYGOMATIC SKIN

Margaret J. Nielsen, 2918 S. 121st St., Omaha, Nebr. 68144

Filed Oct. 13, 1983, Ser. No. 541,457
Int. Cl.[4] A61H 15/00; A45D 40/26
U.S. Cl. 128—57 2 Claims



1. Massaging tool for treating the lower-eyelid and adjacent zygomatic skin areas and during such usage being adapted to reciprocatably rollably traverse along said skin areas in both the general up-down and the general right-left areal directions, said massaging tool comprising:

A. a frame member including a handle extending along a longitudinal-axis and a primary and a secondary mounting means for rotatable members, said frame member comprising two removably connected unitary sub-parts, each sub-part providing substantially one-half of a generally concave shaft primary mounting means extending abruptly to said longitudinal-axis, and each sub-part also providing substantially one-half of a said handle that also includes a said secondary mounting means having a plurality of short-axles respectively consecutively spaced along said longitudinal-axis;

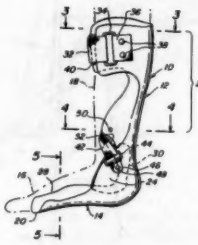
B. a plurality of rotatable members individually revolvably surrounding said concave shaft primary mounting means; and

C. a rotatable member revolvably surrounding each of said short-axles of the secondary mounting means.

4,554,912
PLASTIC ORTHOTIC THERAPEUTIC DEVICE

Louis J. Haberman, c/o Long Hill Medical Ctr., 9 Post Rd., Oakland, N.J. 07436

Filed Jan. 18, 1984, Ser. No. 571,821
Int. Cl.[4] A61F 3/00
U.S. Cl. 128—80 E 7 Claims



1. A plastic orthotic therapeutic device comprising in combination greave or leg section, a plantar or foot section, said greave or leg section and said plantar or foot section being integral and rigidly formed of unitary construction, means for providing forces to correct the deforming components of equinus or foot drop, simultaneous means for providing forces to correct the deforming components of varus or foot inversion, means for providing for comfort to a wearer when said plastic orthotic device is worn and means for allowing the wearer of said orthotic device to easily don and doff said device, wherein said means for providing forces to correct the deforming components of equinus or foot drop consist of a three point pressure system including a foot plate, a broad proximal posterior section, and the shoe of the wearer, and wherein said means for providing forces to correct the deforming components of varus or foot inversion consist of a three point pressure system including an appropriately relieved malleolar area, a high medial wall, an extended projection proximal to the medial malleolus, and an extended trim line over the first tarsal bone of said wearer.

4,554,913
ADJUSTABLE JOINT FOR A KNEE BRACE

Darryl L. Womack, Lakewood; Ralph B. Noell, Denver, and Larry R. Bradshaw, Arvada, all of Colo., assignors to Scott Orthopedics, Inc., Denver, Colo.

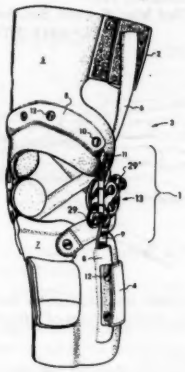
Filed Nov. 7, 1983, Ser. No. 548,932
Int. Cl.[4] A61F 3/00
U.S. Cl. 128—80 C 27 Claims

1. A knee brace comprising:

a thigh engaging component, a calf engaging component, and means for securing said components respectively to the thigh and calf of a person,

means for mounting said thigh and calf engaging components to each other, said mounting means including a polycentric pivot having first and second members with mating gear teeth, means for securing one of said membes to said thigh engaging component and the other of said members to the calf engaging component, and means for mounting said first and second members for rotation about respective first and second axes with the respective gear teeth of said first and second members mating whereby rotation of the first member about the first axis causes the second member to rotate about the second axis and rotation of the second member about the second axis causes the first member to rotate about the first axis, said first member further having an elongated portion extending outwardly of the first axis and moving along a first path as said first member rotates about the first axis, and,

means for restricting the movement of said first member about the first axis, said restricting means including a stop member and means for selectively supporting a portion of said stop member at first and second locations spaced from one another along said first path whereby said first member of said polycentric pivot can rotate about said first axis until said elongated portion thereof abuts said portion of said stop member at either said first or second location, said means for selectively supporting said portion of said stop member including a support member, means for mounting said support member in a fixed position relative to said first and second axes of said polycentric pivot, and means for mounting said portion of said stop member to

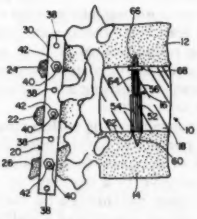


said support member for selective rotation about a third axis, said portion of said stop member extending eccentrically about said third axis, and said mounting means further including means for selectively affixing said portion of said stop member in fixed non-rotating relationship to said support member at first and second positions about said third axis with said first position defining said first location of said portion of the stop member along said first path and said second position defining said second location of said portion along said first path.

4,554,914
PROSTHETIC VERTEBRAL BODY

John P. Kapp, 1933 Petit Bois N., and Robert R. Smith, 2574 Lake Cir., both of Jackson, Miss. 39211

Filed Oct. 4, 1983, Ser. No. 538,911
Int. Cl.[4] A61F 5/04, 5/00, 1/04
U.S. Cl. 128—92 C 16 Claims



1. A prosthetic vertebral body for use in a cavity left by the removal of a defective vertebral body located between adjoining healthy vertebral bodies comprising:

an adjustable support means which is locatable totally within the cavity between the two adjoining vertebral bodies for supporting the adjoining vertebral bodies axially and for adjusting the axial spacing of the adjoining vertebral bodies;

a cast material which is poured in the cavity and which hardens such that said adjustable support means is embedded therein; and

an attaching means for rigidly attaching the spinous process of the defective vertebral body to the spinous processes of the adjoining vertebral bodies.

4,554,915

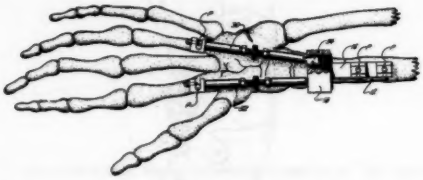
BONE FIXATION FRAME

David L. Brumfield, Nesbit, Miss., assignor to Richards Medical Company, Memphis, Tenn.

Filed Mar. 8, 1983, Ser. No. 473,199

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 A **12 Claims**



1. An orthopedic immobilization device for immobilizing bone sections on opposite sides of a fracture or joint, comprising:

a. a fixation block;

b. a pair of arms connected to the block and extending from it for connecting with one of the bone sections;

c. universal movement means for providing universal movement between one end of the arms and the fixation block;

d. means for tightening the universal movement means for rigidly connecting the fixation block and arms;

e. length adjustment means for adjusting the length of the arms;

f. an open ended slot at the other end of the arms for receiving pins connected to said one bone section;

g. means for rigidly connecting the pins and arms;

h. the fixation block including pin receiving means for rigidly connecting the block to a second set of pins connected to another bone section on the other side of the fracture or joint.

4,554,916

ROTARY PROPORTIONING INHALATOR

James Watt, 211 W. 56th St., Suite 18M, New York, N.Y. 10019

Filed Jul. 27, 1983, Ser. No. 517,846

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—203.12 **29 Claims**

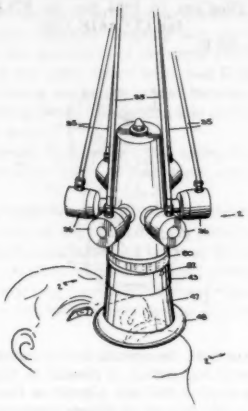
1. A proportional mixing inhalator for mixing and supplying a mixture of at least three therapeutic gases to a patient while maintaining the proportion of at least one of the gases at a life-sustaining level, the inhalator comprising:

first body means comprising a wall surface penetrated by at least three inlet portals;

demand valve means having outlets coupled, respectively, to each inlet portal and having inlets for receiving, respectively, one of the gases to be mixed, each demand valve means responsive to a decrease in pressure level at its outlet to deliver gas through the outlet;

second body means comprising a wall surface conformably fitted to the wall surface of the first body means and movable relative thereto, the second body means comprising a mixing chamber;

aperture means in the wall surface of the second body means, the aperture means communicating with the mixing chamber and movable with the wall surface of the second body to close off inlet portals in the first body means, the aperture means and the portals being so disposed that at least one inlet portal to which the one gas is coupled can not be completely closed off, while the portals to which the remaining gases are coupled can be partially or fully closed off; and



means for delivering mixed gas from the mixing chamber to the nose and mouth of the patient.

4,554,917

LASER OPHTHALMOLOGICAL SURGICAL DEVICE

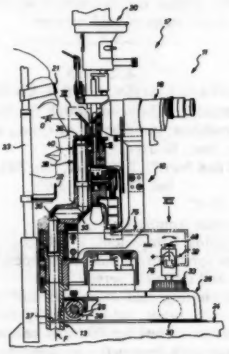
Luc Tagnon, Saint Mande, France, assignor to Essilor International Cie Generale d'Optique, Creteil, France

Filed Mar. 29, 1983, Ser. No. 480,106

Claims priority, application France, Apr. 1, 1982, 82 05654

Int. Cl.[4] A61N *5/02*

U.S. Cl. 128—303.1 **13 Claims**



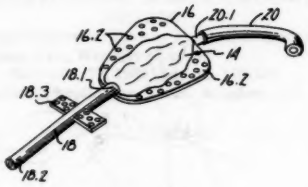
1. An ophthalmological surgical device comprising a laser means for generating at least one laser beam along a path and an operating means for focusing the one laser beam on an aiming point; said operating means including a base, a support chassis adjustably mounted on said base, first control means for adjusting the position of said chassis on said base, a focusing lens and a mirror on an exit side of said lens arranged along the path of the laser beam when in operation, a support assembly supporting said lens and said mirror and adjustably mounted on said chassis, and second control means, independent of said first control means, for adjusting the position of said support assembly on said support chassis toward and away from said base.

4,554,918

OCULAR PRESSURE RELIEF DEVICE

Thomas C. White, 1127 Holly Dr., Sioux Falls, S. Dak. 55705

Filed Jul. 28, 1982, Ser. No. 402,774
Int. Cl.[4] A61M *27/00*; A61F *1/00*
U.S. Cl. 604—10 13 Claims



1. A prosthetic device for the relief of high intraocular pressure associated with glaucoma comprising:

(a) a limp, expandable, compressible reservoir adapted to be positioned within or adjacent to the exterior eye surface; said reservoir being constructed so that when so positioned, said reservoir does not resiliently regain its shape and is maintained at about atmospheric pressure;

(b) a proximal conduit having one end extendable into the anterior chamber of the eye and fastenable to the wall of the eye, and having its other end in communication with said reservoir whereby eye fluid may escape into said reservoir;

(c) unidirectional flow means restraining liquid flow within said proximal conduit to a direction toward said reservoir; said flow means further including pressure relief means adapted to open when the pressure in the eye exceeds the pressure in said reservoir by a pre-set threshold pressure; and

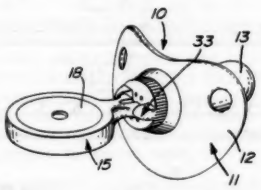
(d) means communicating said reservoir with surrounding liquid-receptive tissue and having valve means permitting only unidirectional flow therethrough, whereby said reservoir may be manipulated to a high reservoir pressure needed to expel eye fluid outwardly therefrom through said distal conduit.

4,554,919

MUSICAL PACIFIER

Claudette Hubert, St-Bruno, Canada, assignor to CX Packaging Inc., Ste-Julie, Canada

Filed Dec. 4, 1984, Ser. No. 677,993
Int. Cl.[4] A61J *17/00*
U.S. Cl. 128—360 10 Claims



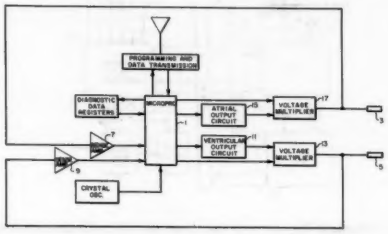
1. A musical pacifier comprising a mouthpiece having a nipple portion, a casing secured to said mouthpiece and housing an electronic programmed circuit capable of generating signals to produce a programmed sound, sound generating means associated with said circuit to audibly reproduce said signals, and switch means to actuate said circuit.

4,554,920

MICROPROCESSOR CONTROLLED CARDIAC PACEMAKER AND METHOD FOR AVOIDING PACER SUSTAINED TACHYCARDIA

Ross G. Baker, Jr., and Richard V. Calfee, both of Houston, Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Nov. 22, 1982, Ser. No. 443,830
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 28 Claims



1. A pacemaker for monitoring cardiac activity of a heart and for pacing the heart, comprising:

means for sensing electrical signals in the ventricle of a heart;

means for sensing electrical signals in the atrium of the heart;

timing means for timing an atrial refractory period having a first preselected duration when an electrical signal occurs in the ventricle while connective tissue between the atrium and ventricle is refractory and a second greater duration when an electrical signal occurs in the ventricle while said connective tissue is operative to allow retrograde conduction of the signal from the ventricle to the atrium, said second greater duration ensuring that a signal transmitted from the ventricle to the atrium by retrograde conduction will fall within the atrial refractory period when it reaches the atrium; and

means for pacing the ventricle at a predetermined time period after an electrical signal is sensed in the atrium outside said atrial refractory period.

4,554,921

DUAL CHAMBER PACEMAKER WITH AUTOMATIC HIGH RATE LIMIT MODE DETERMINATION

Wim Boute, Doesburg; Frederik H. M. Wittkampf, Brummen, and Gerrit W. van Arragon, Dieren, all of Netherlands, assignors to Vitafin N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 465,890, Feb. 11, 1983. This application Dec. 27, 1983, Ser. No. 566,059
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG 11 Claims

1. A dual chamber pacemaker system having means for sensing atrial heartbeat signals and means for delivering ventricular stimulus signals in response to said sensed atrial signals, characterized by:

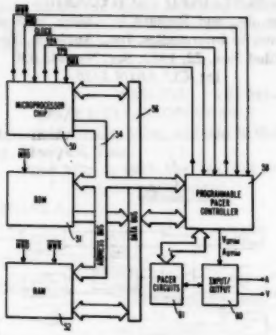
high rate means for detecting when sensed atrial signals have a high rate greater than a predetermined normal maximum rate;

delay means selectively operative when a said high rate is detected for delaying said ventricular stimulus signals relative to the preceeding sensed atrial signals so that the rate of said ventricular signals does not exceed said normal maximum rate;

block means selectively operative when a said high rate is detected for providing n:1 block rate

selection means for automatically selecting when said delay means or said block means is operative, said selection means including means for detecting atrial heartbeat signals occurring at rates corresponding to a predetermined

examination rate range below said normal maximum rate and logic means for selecting said delay means as a predetermined function of said heartbeat signals detected within said examination rate range.



4,554,922

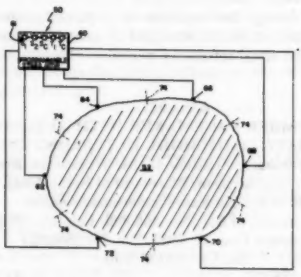
METHOD OF INHIBITING CARDIAC ARRHYTHMIAS

Eric N. Prystowsky, 9013 Sweetbay Ct., and Douglas P. Zipes, 2113 Brewster Rd., both of Indianapolis, Ind. 46260

Filed Sep. 30, 1982, Ser. No. 429,827

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **12 Claims**



1. In a method of pacing a heart, which includes the step of applying electrical stimuli to the heart to propagate rhythmic responses, the improvement comprising the steps of determining a characteristic refractory time period between a patient's rhythmic responses within which an electrical stimulus can be applied to the patient's heart without propagating a heart response, sensing each rhythmic heart response, determining a time within the refractory time period after each sensed rhythmic heart response for the application of an electrical stimulus to the heart, after each rhythmic heart response, generating a conditioning electrical stimulus having an amplitude which is a function of the determined time so that it will not propagate a heart response, and applying the conditioning electrical stimulus to the patient's heart at the determined time during the refractory time period after the sensed rhythmic heart response to inhibit a subsequent spontaneous arrhythmic response before the next rhythmic heart response.

4,554,923

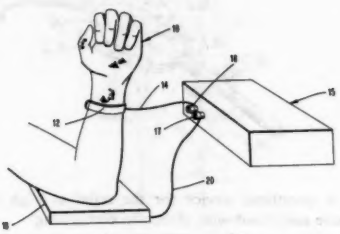
ELECTRICAL THERAPEUTIC ASSEMBLY AND METHOD FOR REDUCING PAIN AND EDEMA IN A HAND

Robert C. Batters, 3125 Boulder Way, Eastpoint, Ga. 30344

Filed Aug. 30, 1982, Ser. No. 413,103

Int. Cl.[4] A61N *1/32, 1/04*

U.S. Cl. 128—421 **14 Claims**



1. A method of reducing pain in the hand of a human body, said method comprising the steps of:

(a) enveloping the hand of the body to be treated with a glove composed of an electrically conducting, woven, metal mesh material contiguously disposed with respect to the skin of the hand,

(b) said skin being free from any externally applied medium so that there is a substantially dry contact between the skin and the electrically conducting material,

(c) electrically connecting the electrically conducting mesh material to a source of electric current,

(d) passing a substantially uniform electric current throughout the entire conducting material to apply said current to said hand,

(e) applying said current at a shock pulse rate sufficient to reduce pain in said enveloped hand without causing heat buildup within the tissue of the hand area.

4,554,924

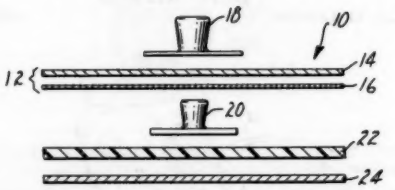
CONDUCTIVE ADHESIVE AND BIOMEDICAL ELECTRODE

Michael R. Engel, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 114,565, Jan. 23, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,570

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—640 **12 Claims**



1. In an ECG electrode comprising an electrode plate having an upper surface and a lower skin-directed surface, means for electrically-connecting said electrode plate to the lead wire of an electrocardiograph, and a layer of an electrically-conductive pressure-sensitive adhesive on the lower surface of electrode plate, the improvement wherein said adhesive comprises a nonionic swellable, conformable, cohesive, dermally-nonirritating hydrophilic synthetic cross-linked acrylic acid polymer; polyhydric alcohol which is liquid at about 20° C.; and an

ionizable salt in an amount effective to render said adhesive electrically-conductive; said polymer being polymerized and cross-linked after formation into said layer to form a continuous covalently-bonded network throughout said layer.

4,554,925

NUCLEAR MAGNETIC RESONANCE IMAGING METHOD

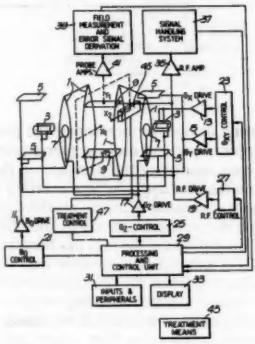
Ian R. Young, Sunbury-on-Thames, England, assignor to Picker International, Ltd., Wembley, England

Filed Jun. 27, 1983, Ser. No. 508,480

Claims priority, application United Kingdom, Jul. 7, 1982, 8219628

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—653 **5 Claims**



1. A method for treating animal tissue, in vivo, said method comprising the steps of:

(a) changing the temperature of tissue in an internal region of an animal body relative to temperature of tissue in an adjacent region;

(b) operating a nuclear magnetic resonance imaging apparatus substantially simultaneously with performance of said temperature changing step to produce a continuous spatial mapping representation of temperature within said body over a portion of said body at least partially including a part of said internal region upon which said temperature changing step is performed;

(c) controlling said temperature changing step as a function of temperature indication produced in said nuclear magnetic resonance operating step.

4,554,926

ULTRASONIC PULSE DOPPLER BLOOD FLOW METER WITH PROVISION TO CREATE ULTRASONIC TEST WAVES WHICH, WHEN REFLECTED FROM A STATIONARY OBJECT, RESULT IN ECHOES SIMILAR TO THOSE PRODUCED BY A MOVING OBJECT

Toshio Shirasaka, Tochigi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 30, 1982, Ser. No. 430,003

Claims priority, application Japan, Oct. 23, 1981, 56-168644

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—663 **5 Claims**

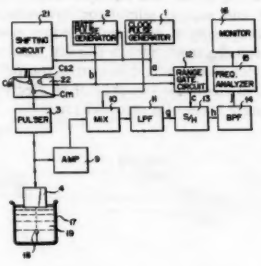
1. An ultrasonic pulse Doppler blood flow analyzer including a testing circuit comprising:

rate pulse generating means for producing rate pulses of predetermined periods;

drive pulse generating means responsive to the rate pulses for producing drive pulses;

transducer means responsive to the drive pulses for transmitting an ultrasonic waves toward a stationary object to be detected and responsive to the echoes thereof for converting the received echoes into an electrical signal;

range gate circuit means for producing a range gate pulse after each of the rate pulses for sampling only echo signals from the stationary object;



frequency analyzing means for frequency analyzing the sampled echo signals; and

shifting circuit means for shifting the rate pulses and the range gate pulses relative to each other by a predetermined time at every individual period of the rate pulses to change the sampled echo signals into quasi Doppler-shifted signals.

4,554,927

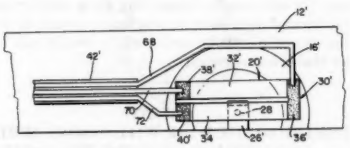
PRESSURE AND TEMPERATURE SENSOR

Theodore J. Fussell, Bridgewater, N.J., assignor to Thermometrics Inc., Edison, N.J.

Filed Aug. 30, 1983, Ser. No. 527,742

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—670 **15 Claims**



1. A pressure and temperature sensor comprising:

a piezoresistive element having first and second legs electrically interconnected at one end thereof;

pressure imparting means for imparting pressures to be measured to only said first leg;

resistor means exhibiting a predetermined value of resistance;

first means for sensing resistance exhibited by said first and second legs of said piezoresistive element such that temperature variations in said first leg are compensated by corresponding temperature variations in said second leg to thereby provide an inherently temperature independent output signal corresponding to said pressure to be measured; and

second means for sensing resistance exhibited by said second leg and said resistor means, said second means for providing a pressure independent output signal corresponding to environmental temperature.

4,554,928

ELECTROPHYSIOLOGICAL SWITCHING UNIT

Wilton W. Webster, Jr., 1388 Crest Dr., Altadena, Calif. 91001

Filed Sep. 16, 1983, Ser. No. 533,266

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—709 **17 Claims**

1. A switching unit for interconnecting multiple-electrode

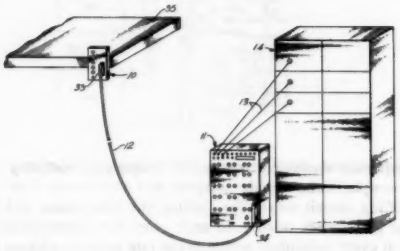
catheter leads, stimulator leads and recorder channel leads comprising:

at least one column of switches comprising:

at least two electrode switch pairs each comprising first and second electrode switches, each electrode switch having a pole and multiple selector positions;

first and second stimulator row-selector switches each comprising a pole and selector positions designating each electrode switch pairs of that column;

means for electrically connecting the poles of the first and second electrode switches of an electrode switch pair to separate leads of a recorder channel;



means for electrically connecting the selector positions of both electrode switches of a switch pair to the electrode leads of a multiple electrode catheter;

means for electrically connecting the poles of the stimulator row-selector switches to separate leads of a stimulator;

means for electrically connecting each selector position of the first stimulator row-selector switch to the pole of the first electrode switch of the electrode switch pair designated by that selector position; and

means for electrically connecting each selector position of the second stimulator row-selector switch to the pole of the second electrode switch of the switch pair designated by that selector position.

4,554,929

CATHETER GUIDE WIRE WITH SHORT SPRING TIP AND METHOD OF USING THE SAME

Wilfred J. Samson, Saratoga, and Ronald J. Solar, Palo Alto, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Jul. 13, 1983, Ser. No. 513,222

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—772 **16 Claims**

1. In a guide wire for use in the placement of a catheter in the cardiovascular system, an elongated shaft of relatively rigid material having proximal and distal ends and a cross-sectional area subtantially smaller than the luminal opening in the catheter, a relatively flexible helical coil having proximal and distal ends, said coil having an outer diameter slightly smaller than the diameter of the luminal opening and a length substantially less than the length of the shaft, the distal end portion of the shaft extending into the coil but terminating short of the distal end of the coil, the portion of the shaft extending into the coil being tapered to provide a gradual transition in flexibility of the shaft, means for bonding the proximal end of the coil to the shaft and a flexible safety wire disposed interiorally of the coil and having one end bonded to the distal extremity of the shaft and having the other end bonded to the distal extremity of the coil.

4,554,930

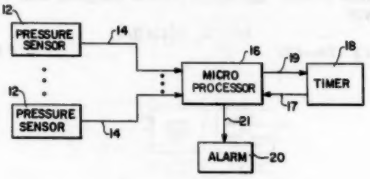
PRESSURE SENSING DEVICE AND METHOD FOR PREVENTING ULCER FORMATION

Donald W. Kress, 27 Forest Rd., Wheeling, W. Va. 26003

Filed Jun. 28, 1984, Ser. No. 625,651

Int. Cl.⁴ A61B *9/00*

U.S. Cl. 128—774 **17 Claims**



1. A pressure sensing device for monitoring the pressure on a patient's skin in order to prevent damage thereto comprising means for continuously measuring the pressure on the skin at the interface between the skin and a surface exerting the pressure on the skin, means associated with said pressure measuring means for monitoring the pressure exerted on the skin and the elapsed time period during which the skin has been exposed to said measured pressure, and means associated with said monitoring means for indicating when the combination of the pressure measured by said pressure measuring means and the elapsed time is approaching a previously determined level.

4,554,931

APPARATUS FOR SEVERING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

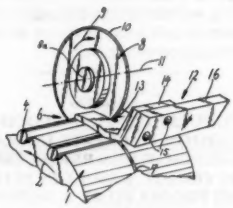
Siegfried Born, Geesthacht, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,586

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238233

Int. Cl.⁴ A24C *5/00, 5/60*

U.S. Cl. 131—84.4 **7 Claims**

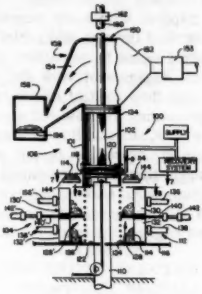


1. Apparatus for severing rod-shaped articles of the tobacco processing industry, comprising a conveyor arranged to advance the articles along a predetermined path and in a predetermined direction at right angles to the axes of the conveyed articles; a rotary disc-shaped knife having a marginal cutting edge and being disposed in a plane extending at right angles to the axes of the conveyed articles, said cutting edge extending into said path to sever the oncoming articles on said conveyor: guide means for said knife, said guide means having a channel for said cutting edge adjacent to the location of penetration of the cutting edge into the oncoming articles; and a stationary support for said guide means.

4,554,932
PRESSURE VESSEL AND METHOD OF USING SAME

Lucas J. Conrad, Winston-Salem, and Jackie L. White, Pfafftown, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Mar. 3, 1983, Ser. No. 471,580
Int. Cl.[4] A24B *3/18*
U.S. Cl. 131—296 **43 Claims**



1. A system for use in a process for increasing the filling power of tobacco comprising:

(a) a pressure vessel including a cylindrical tubular shell and a spool assembly means movable between at least a first position outside the shell and a treating position within the shell, said spool assembly including first and second circular end members, connecting rod extending between and securing said first and second end members together and sealing means with at least one sealing member circumscribing each end member, said sealing members contacting the inner surface of said shell when the spool assembly means is in the treating position so that said shell, end members and seal members form a pressure chamber and said connecting rod acts as a tension member to carry loads applied to said end members when such chamber is pressurized;

(b) means for moving the spool assembly means between at least a first position outside said tubular shell and the treating position;

(c) means for loading and unloading material to and from said spool assembly means when said spool assembly means is outside the tubular shell; and

(d) means for introducing a processing fluid into said pressure vessel when said spool assembly means is in said treating position, whereby said material contained therein is impregnated with said processing fluid.

4,554,933
TOBACCO OPENING AND CONDITIONING APPARATUS

Richard E. Neville, Salisbury, England, assignor to AMF Incorporated, White Plains, N.Y.

PCT No. PCT/GB81/00272, § 371 Date Sep. 13, 1982, § 102(e) Date Sep. 13, 1982, PCT Pub. No. WO82/02324, PCT Pub. Date Jul. 22, 1982
PCT Filed Dec. 16, 1981, Ser. No. 420,221
Claims priority, application United Kingdom, Jan. 15, 1981, 8101201; Oct. 1, 1981, 8129689; Nov. 24, 1981, 8135442
Int. Cl.[4] A24B *3/06*
U.S. Cl. 131—304 **16 Claims**

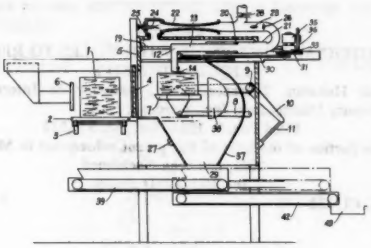
1. An opener and conditioner of a body of tobacco lamine comprising:

a chamber for receiving a body of tobacco laminae;

a jet box having

a strip jet means for emitting a jet of air and moisture in a direction oblique to the surface of the body of tobacco laminae; and

means for reciprocating said jet box with respect to the body of tobacco within a plane parallel to and in close proximity to the surface plane of the tobacco laminae,

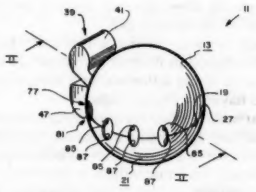


said strip jet preconditioning the tobacco laminae while separating one or more laminae progressively from the body of tobacco with each reciprocating stroke of said jet box.

4,554,934
HAIR CLAMP DEVICE

Betty F. Mooneyhan, 278 Sunflower, Clarksdale, Miss. 38614

Continuation-in-part of Ser. No. 613,777, May 24, 1985, abandoned. This application Oct. 15, 1984, Ser. No. 661,096
Int. Cl.[4] A45D *2/00, 24/36*
U.S. Cl. 132—40 **13 Claims**



1. A device for being clamped to a strand of hair, said device comprising:

(a) a first bowl member having an opened cavity defining an interior surface and having a rim;

(b) a second bowl member having an opened cavity defining an interior surface and having a rim;

(c) hinge means for pivotally attaching said first and second bowl members to one another and for normally urging said rims of said first and second bowl members substantially against one another to allow said opened cavities of said first and second bowl members to define a substantially closed cavity;

(d) a first plate member having a substantially flat obverse face and having a reverse face;

(e) a first spring member having a first end attached to said reverse face of said first plate member and having a second end attached to said interior surface of said cavity of said first bowl member to normally urge said obverse face of said first plate member outwardly of said rim of first bowl member;

(f) a second plate member having a substantially flat obverse face and having a reverse face; and

(g) a second spring member having a first end attached to said reverse face of said second plate member and having a second end attached to said interior surface of said cavity of said second bowl member to normally urge said obverse face of said second plate member outwardly of

said rim of said second bowl member and substantially against said obverse face of said first plate member to securely hold a strand of hair between said obverse faces of said first and second plate members when said rims of said first and second bowl members are urged substantially against one another.

4,554,935

ARTIFICIAL FINGERNAIL WITH HOLES TO RECEIVE LIQUID ADHESIVE

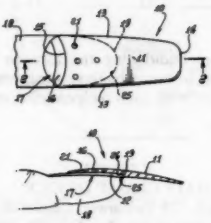
Yosh Hokama, Torrance, Calif., assignor to International Beauty Distributors, Inc., Gardena, Calif.

Filed Feb. 9, 1984, Ser. No. 578,511

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.[4] A45D *29/00*

U.S. Cl. 132—73 **7 Claims**



1. In an artificial fingernail attachable to a natural fingernail having a forward edge and a rearward edge, the artificial nail comprising:

(a) a thin plastic sheet element sized to provide a forward extension of the natural nail,

(b) the said element having a rearward portion with its underside shaped to fit over and attach to the natural nail by means of liquid adhesive, said element rearward portion also having an upper side,

(c) said rearward portion having multiple openings between said under and upper sides to receive liquid adhesive when said underside is pressed downwardly upon the natural nail, whereby the liquid adhesive when cured substantially fills the openings and locks the natural nail to the walls of the openings, said openings being of pin-hole size and extending through said sheet element, said openings having diameters between 0.01 and 0.05 inches,

(d) said element forming a recess in said rearward portion to receive and conform generally to the shape of the forward extent of said natural nail, all of said openings intersecting said recess,

(e) said element also forming a rearwardly presented crescent shaped distal edge forwardly bounding said recess, all of said openings spaced rearwardly of said distal edge, said element rearwardly of said recess being thinner than said element forwardly of the recess,

(f) said upper side having roughening to receive and adhere to nail polish applied to said upper side, said openings communicating with said roughening,

(g) said recess opening downwardly throughout the entire length between said rearward edge and said distal edge.

4,554,936

WASHING MACHINE CONTAINER COUPLING APPARATUS

James E. Tingley, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Mar. 16, 1984, Ser. No. 590,408

Int. Cl.[4] B08B *3/04*

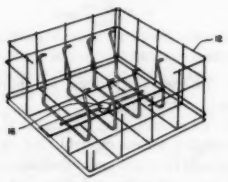
U.S. Cl. 134—146 **6 Claims**

1. Apparatus for selectively coupling a source of pressurized fluid to washing machine containers which hold items during wash cycles where there are first containers adapted to prevent the flow of fluid and second containers adapted to receive the fluid when the respective containers are placed in their normal positions in the washing machine, comprising:

a member having a contoured passage therethrough, said member defining an inlet and an outlet;

said passage having a first bore, a second bore having a greater width than said first bore and a shoulder formed between said first and second bores;

means slidably disposed within said member for controlling the flow of the fluid through said outlet to the container, said flow control means having a first portion structured to permit such engagement with the contours of said passage that said flow control means can assume a first position for preventing the flow and a second position for permitting the flow, and said flow control means having a second portion structured to permit such engagement with the container that said flow control member assumes said first position when said second portion engages the first container and assumes said second position when said second portion engages the second container;



said first portion of said flow control means having a body and a flange;

said second portion of said flow control means having an elongate pin extending from said body through said outlet for engagement with the container;

said first position being one in which said pin is in such engagement with the first container that said body is disposed entirely within said first bore and said flange is in such sealing engagement with said shoulder that fluid cannot flow through said outlet;

said second position being one in which said pin is in such engagement with the second container that the flow of fluid can so move said flange out of engagement with said shoulder and can move so much of said body into said second bore that the fluid can flow through said outlet into said second container, each of said bores being proportioned to permit the flow of fluid in such volume and at such pressures when said body is in said second position that a predetermined sufficient rate of can be maintained; and

means for sealing the coupling.

4,554,937

PORTABLE SHELTER

Dennis V. Irwin, 4630 Macky Way, Boulder, Colo. 80303

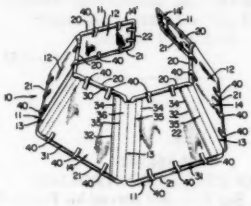
Filed Mar. 4, 1983, Ser. No. 472,029

Int. Cl.[4] A45F *1/16*

U.S. Cl. 135—100 **13 Claims**

1. A portable, free-standing shelter of generally frusto-conical configuration having a base and upwardly inclined sidewalls terminating in an open top, said sidewalls defined by a plurality of flexible sheet panel members, each panel member of generally polygonal configuration having top and bottom edges interconnected by upwardly convergent opposite sides; connecting means interconnecting adjoining sides of said panel members in hinged together relation, the bottom edges of said panel members defining the base of said shelter and the top edges of said panel members defining the open top of said shelter; a plurality of frame members to hold said flexible sheet

panel members in a stretched, taut condition, each of said frame members being formed in a trapezoidal configuration



and each of said panel members includes a releasable fastening means for releasably securing each of said panel members to the top and bottom edges of its respective frame member.

4,554,938

DEVICE FOR CONVERTING ELECTRIC SIGNALS INTO PNEUMATIC SIGNALS

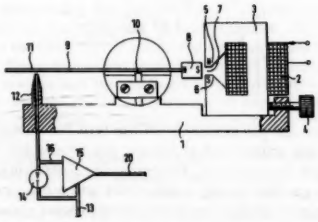
Lorenz Twisselmann, Prisdorf, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,367

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205576

Int. Cl.⁴ G05D *16/00*

U.S. Cl. 137—82 **16 Claims**



1. In a device for converting electric signals into pneumatic signals of a pneumatic system, the device having a coil and a permanent magnet which are moveable relative to each other in response to a current flowing within the coil, said device having a mechanical means of adjustment for influencing the pneumatic system, the improvement comprising

a stationary core which is closed by an air gap and includes two pole shoes, the core passing through the coil to form said electromagnet;

a permanent magnet of highly coercive material disposed for movement within the field of attraction of the two pole shoes,

means for mechanically connecting said permanent magnet to said adjustment means such that movement of said permanent magnet actuates said adjustment means, the moving mass of said permanent magnet and said connecting means and said adjustment means being minimized; and wherein

said connecting means includes means for freely pivoting said connecting means such that movement of said permanent magnet operates said adjustment means in response to forces of said electromagnet upon said permanent magnet; and

said pivoting means is located away from said air gap so as to preserve substantially a perpendicular relationship between a magnetization axis of said permanent magnet and a magnetic flux in said air gap.

4,554,939

METERING APPARATUS

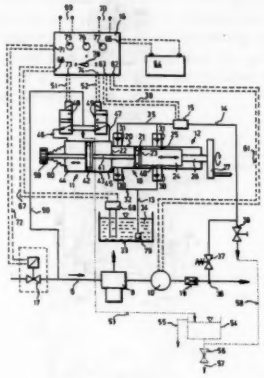
Hans Kern, Vachendorf, and Richard Haslberger, Hufschlag, both of Fed. Rep. of Germany, assignors to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW), Vienna, Austria

Filed Sep. 20, 1983, Ser. No. 533,934

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236488

Int. Cl.⁴ G05D *11/02*

U.S. Cl. 137—99 **16 Claims**



1. A metering apparatus for metering into a liquid flow an agent which is to be metered in a proportional relationship, comprising:

a liquid meter for delivering signals representative of the throughflow of the liquid flow;

means defining a metering location where said agent is delivered to said liquid flow;

a reservoir holding said agent to be metered;

a metering pump having an input side and an output side;

said metering pump being connectable to said reservoir at said input side and to said metering location at said output side;

said metering pump metering said agent from said reservoir into said liquid flow as a function of said signals delivered by said liquid meter;

said means defining a metering location including a conduit portion provided with an inflow connection and an outflow connection;

said liquid meter being operatively associated with said conduit portion;

a supporting frame;

said conduit portion, said liquid meter and said metering pump being mounted at said supporting frame; and

said supporting frame enclosing essentially at all sides said conduit portion, said liquid meter and said metering pump.

4,554,940

PRESSURE REDUCING AND REGULATING VALVE

Ronald L. Loup, Clarkson, Mich., assignor to Koomey, Inc., Brookshire, Tex.

Continuation-in-part of Ser. No. 339,554, Jan. 15, 1982, Pat. No. 4,444,216. This application Sep. 9, 1983, Ser. No. 531,302

Int. Cl.⁴ F16K *3/18*; G05D *16/00*

U.S. Cl. 137—116 **9 Claims**

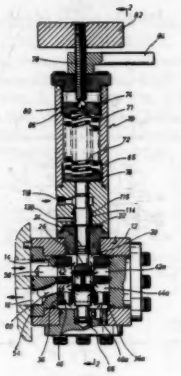
1. In a pressure reducing and regulating valve having a body cavity, a plunger having a piston movable in the body and connected to a seal container having a plurality of openings having circular sliding seals therein, and an inlet, outlet, and vent port connected to the body wherein one of the circular sliding seals controls flow between the inlet and the outlet, the improvement comprising,

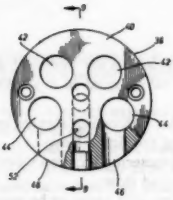
said body including a porting plate having a flat face for mounting to a subplate, said body connected to the subplate by blots, a gland seal between the outer edge of said porting plate and said body,

said porting plate includes inlet and outlet ports communicating between the subplate and said body cavity,

face seals about each of the inlet and outlet port for mating with the subplate, whereby the force of the inlet and outlet pressure acting to separate the port plate from the subplate is compensated by the force of the inlet and outlet pressure in the body cavity acting in a direction to hold the port plate on the subplate, and

the area of the one circular sliding seal in the seal container having substantially the same area as the area enclosed by the face seal about the inlet port.





4,554,941

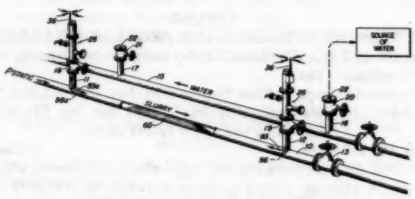
FLUID VIBRATION APPARATUS

Julian B. Coon, Ponca City, Okla., and Eston F. Petry, Barrackville, W. Va., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 11, 1984, Ser. No. 619,745

Int. Cl.[4] F15C *1/08*

U.S. Cl. 137—240 **4 Claims**



1. Apparatus for generating a pressure pulse in a pipeline comprising a vibrator having a mechanical output, means for controlling the phase and frequency of said vibrator mechanical output, a pipe, a piston attached to said vibrator mechanical output and mounted inside said pipe, means for attaching said pipe to said pipeline, a source of fluid coupled for controlled filling of said pipe, and vent means to bleed displaced air out of said pipe.

4,554,942

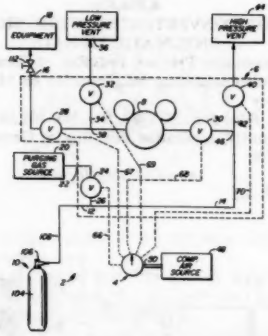
PROCESS GAS CONTROLLER

Todd E. Williams, San Jose, and Steven M. Desch, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 6, 1983, Ser. No. 529,898

Int. Cl.[4] F17D *3/00*; B08B *9/06*

U.S. Cl. 137—240 **18 Claims**



1. A process gas controller of the type for connection to a purging gas source and a process gas source for supplying process gas to equipment, the controller comprising:

a main gas line having a main inlet and a main outlet, said main inlet fluidly connected to the process gas source and said main outlet fluidly connected to the equipment;

a first valve positioned between the purging gas source and said main inlet;

a pressure regulator positioned along said main gas line for providing the process gas to the equipment at a regulated pressure;

a second valve positioned along said main gas line between said main outlet and said regulator;

a third valve positioned along said main gas line between said regulator and said main inlet;

a fourth valve having a fourth valve inlet, fluidly connected to said main gas line between said regulator and said second valve and a fourth valve outlet fluidly connected to a first vent region;

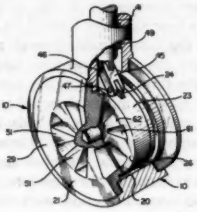
a fifth valve having a fifth valve inlet fluidly connected to said main gas line between said inlet and said third valve and a fifth valve outlet fluidly connected to second vent region, said first through fifth valves being operable to isolate the process gas source from the equipment, to vent gas to said first and second vent regions and to purge the main gas line with gas from the purging gas source; and

a valve controller having a plurality of user selected operating positions and being coupled to a plurality of said first through fifth valves, said valve controller arranged and adapted to control the opening and closing of said plurality of valves according to the operating position chosen by the user.

4,554,943
SINGLE DISC ROTARY VALVE

Robert L. Claney; Herbert H. Walton; Steven D. Kehoe, and Kimball R. Barron, all of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Marshalltown, Iowa

Filed Dec. 2, 1983, Ser. No. 557,716
Int. Cl.[4] F16K *3/08*
U.S. Cl. 137—242 **3 Claims**



1. A throttling valve having an ON and an OFF position adapted for use in a high pressure bidirectional flowpath comprising:

a cylindrical valve body defining a cavity;

a pair of circular end retainers, each defining at least one port, positioned at opposite ends of said cavity with said ports in alignment, and each having a flat inner surface;

a rotatably mounted disc, having oppositely disposed flat surfaces, defining at least one substantially similar shaped port, positioned for rotational movement between said end retainers for varying the relationship between the port of said disc and the ports in said end retainers to control the flow in said flowpath between said OFF and said ON positions, the thickness of said rotatable disc being less than the thickness of either end retainer to assure that the disc flexes more than said end retainers for equal amounts of pressure and the thickness of said rotatable disc being less than the distance between said end retainers to provide for lateral movement of said rotatable disc therebetween;

an operating rod movably mounted in said body;

link means coupled between said operating rod and said rotatable disc for translating linear movement of said operating rod into rotational movement of said disc, said operating rod and said link means being located outside said flowpath; and

bearing shaft means for supporting said disc for rotational movement and for permitting slight lateral movement thereof in the direction of said flowpath, said flat inner surfaces of said end retainers and the corresponding surface of said rotatable disc cooperating, under the force of fluid pressure, to seal said flowpath when said valve is in said OFF position, said end retainers extending beyond the confines of said body to facilitate installation of said valve in a pipeline exerting clamping pressure on said end retainers.

4,554,944
OPERATING WRENCH FOR TAMPERPROOF HYDRANTS

Joseph L. Daghe; Dennis W. Humes, both of Decatur, and Mervin D. Stanley, Stonington, all of Ill., assignors to Mueller Co., Decatur, Ill.

Filed May 22, 1985, Ser. No. 736,831
Int. Cl.[4] F16K *35/06;* F03B *9/06*
U.S. Cl. 137—296 **9 Claims**

1. A tamperproof fire hydrant comprising:

barrel means having an open upper end portion;

valve means in a lower portion of said barrel means;

valve stem means extending from said valve means upwardly within said barrel means;

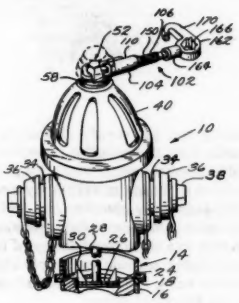
a top closure member secured to the upper end portion of said barrel means, said top closure member having an aperture therethrough;

a rotatable operating nut operatively connected to said valve stem means for reciprocating the same, said rotatable operating nut having a polygonal end portion projecting out of the aperture of said top closure member;

a tubular hold-down nut carried by said top closure member for positioning said rotatable operating nut against axial movement;

a dome shaped cap covering the polygonal portion of said operating nut, said cap having a lower edge spaced from said hold-down nut to provide a limited access space to the polygonal end portion of said operating nut;

means supporting said dome shaped cap on said polygonal end portion of said operating nut for relative free rotation with respect thereto; and



operating means for rotating said polygonal end portion of said operating nut in said limited access space between said dome shaped cap and said hold-down nut, said operating means including a handle assembly having a fixed flat hook-shaped jaw part projecting axially of the same, said fixed flat jaw part having cooperating surfaces spaced from and facing said handle assembly for engaging at least two sides of the polygonal end portion of said operating nut, said fixed flat jaw part having a thickness no greater than said limited access space between said dome shaped cap member and said hold-down nut, said handle assembly further having a movable flat jaw part of a thickness no greater than the thickness of said fixed jaw part and having a surface opposing said surfaces of said fixed jaw part, means to move said movable jaw part toward said fixed jaw part to engage another surface of said polygonal end portion.

4,554,945
LIQUID METERING APPARATUS

Michael L. McKay, Willeton, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

PCT No. PCT/AU82/00225, § 371 Date Aug. 26, 1983, § 102(e) Date Aug. 26, 1983, PCT Pub. No. WO83/02319, PCT Pub. Date Jul. 7, 1983
PCT Filed Dec. 30, 1982, Ser. No. 532,035
Claims priority, application Australia, Dec. 31, 1981, PF2123
Int. Cl.[4] G01F *11/38;* F02M *67/00*
U.S. Cl. 137—312 **15 Claims**

1. Apparatus for delivering metered quantities of fuel to an internal combustion engine, said apparatus comprising:

a rigid body having a metering chamber and a gas supply chamber therein;

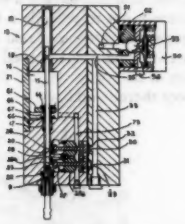
a metering member supported in the body for linear movement relative thereto and adapted to selectively provide gas flow communication between the gas supply chamber and the mtering chamber;

said metering member extending into the metering chamber in the direction of said linear movement;

control means to control the linear movement of the metering member in the body to regulate the extent of projection thereof into the metering chamber;

means communicating said with metering chamber and connectable to a fuel source to permit supply of fuel to the metering chamber;

means carried by the metering member and operable to selectively establish said gas flow communication between



the metering and gas supply chambers, whereby fuel is displaceable from the metering chamber by gas from the gas supply chamber; and

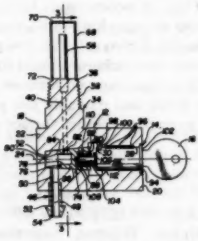
leakage collection means in said body and interposed between said gas supply chamber and said metering chamber, with said metering member extending therethrough, for collection in a separate chamber of leakage from said metering chamber and said gas supply chamber, said separate chamber being isolated from said metering chamber and said gas supply chamber.

4,554,946

DEVICE TO PREVENT FUEL FLOW FROM A FUEL TANK TO AN ENGINE

Michael R. Poole, 4801 Peachtree Rd., Balch Springs, Tex. 75180

Filed Mar. 9, 1984, Ser. No. 587,944
Int. Cl.[4] F16K *35/00*
U.S. Cl. 137—384.2 **11 Claims**



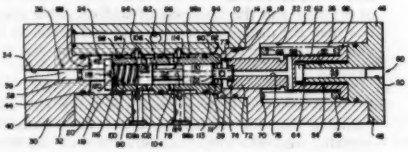
1. A device to control the passage of fuel from a fuel tank to an engine, comprising: an elongated body including first and second ends and a passageway extending from the first end toward the second end, the passageway having first, second and third sections, the third section forming a chamber and having surfaces tapering toward one another when moving toward the second end; an inlet member connected to said body including an inlet passageway for placing the fuel tank in fluid communication with the chamber; an outlet member connected to said body including an outlet passageway for placing the chamber in fluid communication with the engine; an element disposed within said body and movable between a position placing the inlet passageway in fluid communication with the chamber and a position preventing fluid communication between the inlet passageway and the chamber, said element having tapered shoulders adapted to engage the tapering surfaces in the third section to form a surface-to-surface seal which prevents fluid flow between the valve element and the body, said element being in the the shape of a truncated cone with side walls to prevent fluid communication between the passageways in the inlet and outlet members formed by a pocket extending inwardly from the truncated end of said element, a port extending through the side walls into the pocket for placing the inlet passageway in fluid communication with the outlet passageway in the outlet member, said element including a base shoulder formed by a pocket extending inwardly from the base of said element; means for urging said element toward the second end of said body and into engagement with the third section of the passageway extending into said body; locking means disposed in the first section of the passageway extending into said body for securing said element in the position preventing fluid communication between the inlet passageway and chamber and for preventing movement of said element to the position placing the inlet passageway in fluid communication with the chamber; said means for urging including a spring disposed between an end of said locking means and the base shoulder in said element; and means disposed within said body for connecting said locking means to said element to move said element when said locking means moves and to prevent movement of said element until said locking means moves.

4,554,947

LOAD RECALL VALVE

Jasper E. Cobb, III, Gainesville, Tex., assignor to Armco Research and Technology, Middletown, Ohio

Filed Oct. 29, 1984, Ser. No. 666,186
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—596.18 **35 Claims**



1. A load recall valve, comprising:

(a) a hollow valve body having a first pressure inlet, a second pressure inlet, a pilot pressure inlet and a pilot pressure outlet;

(b) said pilot pressure inlet is proximate said pilot pressure outlet;

(c) sleeve means slidably disposed in said body and including means for selectively isolating said pilot pressure inlet from said pilot pressure outlet and further including a longitudinally extending aperture therethrough communicating with a plurality of generally transverse orifices for connecting said aperture to said pilot pressure inlet;

(d) spool means slidably disposed in said aperture and including means for interconnecting said orifices for thereby permitting selective interconnection of said pilot pressure inlet with said pilot pressure outlet;

(e) first pressure receiving means slidably disposed within said body communicating with said first pressure inlet and engagable with said spool means and said sleeve means whereby application of pressure to said first pressure receiving means causes sliding thereof in a first direction and associated sliding of said spool means and subsequently causes sliding of said sleeve means for thereby establishing interconnection between said pilot outlet and said pilot inlet;

(f) resilient means associated with said first pressure receiving means for causing sliding of said first pressure receiv-

ing means in a second direction opposite to said first direction upon cessation of application of pressure thereto;

(g) second pressure receiving means slidably disposed within said body and communicating with said second inlet and adapted for sliding in said first direction upon engagement with said sleeve means and for being displaced in said second direction by application of pressure to said second pressure inlet; and

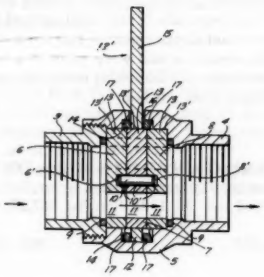
(h) biasing means associated with said second pressure receiving means and said spool means for displacing said spool means in said second direction whereby application of pressure to said first pressure receiving means causes at least said spool means to slide in said first direction to a position associated with the amount of pressure applied for thereby interconnecting said pilot pressure inlet with said pilot pressure outlet and whereby cessation of application of pressure to said second pressure receiving means prior to cessation of application of pressure to said first pressure receiving means causes said sleeve means to remain in said position while said biasing means causes said spool means to slide a distance sufficient to isolate said pilot inlet from said pilot outlet and thereby provide a stored memory position and further whereby cessation of pressure application to said second pressure means after cessation of pressure application to said first pressure receiving means causes said sleeve means to slide in said second direction and thereby erase said stored memory position.

4,554,948

STRAIGHT-WAY VALVE

Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,642
Int. Cl.[4] F16K *3/08*
U.S. Cl. 137—625.31 **4 Claims**



1. A straight-way valve comprising:

a valve body having a longitudinal passageway extending therethrough and a circumferential slot formed between the ends of said passageway;

said valve body having an annular recess formed between the ends of said passageway and being aligned with said circumferential slot;

regulating elements, operably mounted in said valve body, which include a plurality of discs, one of which is mounted for rotation, at least one of said other discs being statically mounted in said valve body and actuating means disposed in said slot and coupled to said rotatable disc;

said rotatable disc having a plurality of flow ports which correspond with flow ports formed in said at least one static disc;

said at least one static disc being arranged in face-to-face contact against said rotatable disc to form a fluid tight, mechanical seal;

said actuating means including an annular part positioned in said annular recess and a lever part which extends outwardly through said circumferential slot, and said rotatable disc being immovably mounted in said annular part;

a pair of resilient bearing rings, being spaced in said annular recess, and positioned around opposed faces of said annular part to provide spring pressure in the axial direction and to absorb transverse forces with respect to said annular part and to provide vent openings therebetween to vent said straight-way valve; and

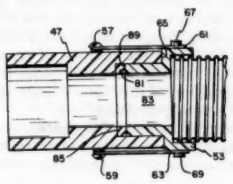
an axle mounted through an axial bore formed in said rotatable disc, at least one end of which, is disposed in a corresponding recess of said at least one static disc for rotation therein so that said actuating means is rotatable from a first operable flow position to a second inoperable non-flow position.

4,554,949

SEWER OUTLET CONNECTING AND CAPPING ARRANGEMENT

James Sell, R.R. #3, Box 157, Muncie, Ind. 47302

Filed Aug. 3, 1984, Ser. No. 637,552
Int. Cl.[4] F16K *27/12*
U.S. Cl. 137—899 **8 Claims**



1. In recreational vehicle of the type having a self-contained sewage system, a coupling arrangement for selectively connecting the vehicle sewage system to a sewage disposal location when the vehicle is parked at a camp site, service station facility or the like while sealingly closing the vehicle sewage system when the vehicle is in transit comprising:

an open ended recreational vehicle sewer outlet fixed to the vehicle at a sufficiently low location on the vehicle to drain the vehicle sewage system, the outlet having an exposed threaded portion near the open end thereof;

a closure cap having a threaded region matable with the outlet threaded portion to sealingly close the outlet open end;

a tether connecting the outlet and closure cap to prevent the closure cap being lost or mislaid when not threadedly engaged with the outlet;

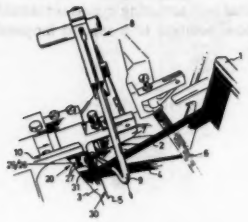
a flexible sewer drain hose having a threaded connector at one end thereof matable with the outlet threaded portion to sealingly connect the drain hose to the outlet open end whereby the drain hose end opposite the threaded connector may be connected to a sewage disposal location and the vehicle sewage system drained thereinto;

both the threaded connector and the closure cap being provided with diametrically opposed portions which may be selectively engaged to aid turning relative to the threaded portion for facilitating threaded coupling and decoupling of the threaded connector and closure cap with the threaded portion.

4,554,950
WEAVING MACHINE, ESPECIALLY A TERRY CLOTH WEAVING MACHINE

Aldo Sancini, and Miguel A. Stacher, both of Arbon, Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed May 29, 1984, Ser. No. 614,680
Claims priority, application Switzerland, Jun. 9, 1983, 3161/83
Int. Cl.[4] D03D *39/22*
U.S. Cl. 139—25 **4 Claims**



1. In a weaving machine, especially a terry cloth weaving machine, wherein:

a horizontal translation of both warp thread systems of an upper shed and of a lower shed together with the already woven fabric takes place for forming loops;

an apparatus for laying-in laid-in edges arranged at each side of the machine for fabricating laid-in edges in the woven fabric;

said apparatus for laying-in laid-in edges having laying-in needles for laying free ends of inserted weft threads back into the weaving shed; the improvement which comprises:

an apparatus for fixing the position of an apex line of the weaving shed over at least the width of an associated laid-in edge region of the fabric fixedly arranged at each side of the weaving machine;

each said apparatus for fixing the position of the apex line of the weaving shed comprising two straight-edges extending substantially parallel to the fabric fell and to the apex line of the weaving shed;

one of said two straight-edges engaging the laid-in edge from above and the other straight-edge engaging the laid-in edge from below;

the two straight-edges mutually overlapping in a prescribed spaced relationship in a direction extending transverse to a plane of the already woven fabric;

the two straight-edges being arranged sequentially in relation to the length of the fabric in a prescribed spaced relationship in a longitudinal direction of the already woven fabric; and

one of the two straight-edges being arranged nearer to a weaving reed of the weaving machine and approximately coincident with the apex line of a selvedge portion of the weaving shed and with a point of weft beat-up of the weaving reed.

4,554,951
METHOD OF REGULATING WARP YARN TENSION IN A WEAVING MACHINE

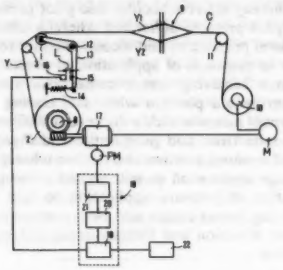
Hideo Hirano, Kariya, and Masahiko Kimbara, Okazaki, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 10, 1983, Ser. No. 550,752
Claims priority, application Japan, Nov. 16, 1982, 57-200794
Int. Cl.[4] D03D *49/06*
U.S. Cl. 139—105 **10 Claims**

1. A method for regulating the tension of warp yarns with reference to a predetermined permissible range thereof spanning a reference point corresponding to an optimum tension of said warp yarns, in a weaving machine which includes a means for tensioning said warp yarns delivered from a warp beam, said tensioning means being movable with a change in tension of said warp yarns in contact therewith, and a means for driving said warp beam at variable speed, said method comprising the steps of:

converting the mechanical movement of said tensioning means into an electrical signal which is proportional to the magnitude of displacement of said tensioning means from a position thereof corresponding to said reference point;

sampling said electrical signals successively in synchronism with the operation of the weaving machine to determine successive instantaneous magnitudes of displacement of



said tensioning means from its said reference point position;

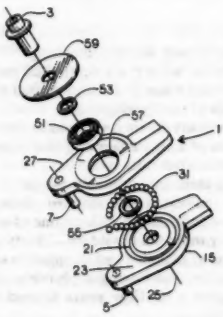
comparing the difference between successive ones of said electrical signal samples with the time difference between the sampling of said successive ones of said samples, to determine a rate of change of said displacement of said tensioning means from said reference point position; and

varying the speed of said warp beam driving means depending upon the magnitude of said displacement and said rate of change of said displacement of said tensioning means to change the tension in said warp yarns in a compensating manner, whereby said tensioning means moves towards its said reference point position.

4,554,952
SEVERING APPARATUS FOR A LOOM

Gerald E. Coleman, 918 Devenger Rd., Greer, S.C. 29651

Filed Dec. 30, 1983, Ser. No. 567,275
Int. Cl.[4] D03D *49/70*
U.S. Cl. 139—302 **3 Claims**



1. A severing device for the weft thread of a loom, comprising:

an axle;

a stationary scissor section fixed to said axle, said stationary

scissor section defining a generally circular groove about and concentric with the axis of said axle;

a rotable scissor section rotably mounted on said axle, said rotable scissor section defining a circular groove to mate with said circular groove of said stationary scissor section whereby adjacent grooves define a raceway; and

ball bearings within said raceway between said scissor sections to act as thrustbearing to minimize wear at adjacent inner scissor faces.

4,554,953

COMPOSITE FABRIC FOR USE AS CLOTHING FOR THE SHEET FORMING SECTION OF A PAPERMAKING MACHINE

Georg Borel, and Hartmut Waldvogel, both of Reutlingen, Fed. Rep. of Germany, assignors to Hermann Wangner GmbH & Co., Reutlingen, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,419

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305713

Int. Cl.⁴ D03D *23/00*

U.S. Cl. 139—383 A **6 Claims**

1. A composite fabric for use as clothing for the sheet forming section of a papermaking machine comprising at least two fabric layers formed by transverse and longitudinal threads and interconnected in that at least part of the transversely extending and, in addition, at least part of the longitudinally extending threads are woven into the upper and into the lower fabric layer, thereby limiting relative movement between the upper and lower fabric layers.

4,554,954

LOOM FOR WEAVING FLAT FABRIC

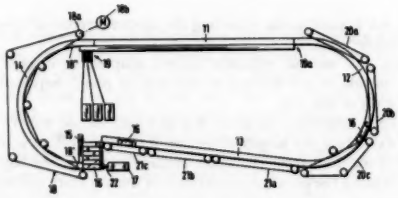
Bernhard Krenkel, and Heinz Joos, both of Heidenheim, Fed. Rep. of Germany, assignors to F. Oberdorfer, Heidenheim, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 550,863

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242121

Int. Cl.⁴ D03D *47/24*

U.S. Cl. 139—439 **20 Claims**



1. In a loom for weaving flat fabric, the combination of a track defining an endless path for gripper shuttles, said track including a reed having a first side for entry of shuttles into and a second side for exit of shuttles from the shed and said track further including an arcuate section at the first side of said reed; a magazine disposed upstream of said arcuate section, as considered in the direction of travel of shuttles along said path, said magazine including means for accumulating a stack of shuttles adjacent to said path ahead of said arcuate section, as considered in said direction; a supply of shuttles in said magazine; means for delivering successive shuttles from said magazine into said arcuate section; means for accelerating successive shuttles at least in the major part of said arcuate section so that the shuttles reach the first side of said reed and enter the shed while moving at a predetermined speed and thereupon return into said magazine; and cooperating first and second guide means respectively provided on said reed and on said shuttles to maintain the shuttles in said path during travel through the shed.

4,554,955

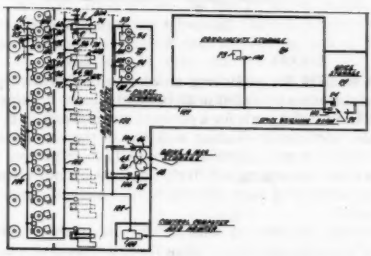
METHOD AND APPARATUS FOR ASSEMBLING FOOD INGREDIENTS

Wolf A. von Lersner; Edward W. Cheeseman, both of Cherry Hill; Thomas K. Simpson, Merchantville, and George R. Weaver, Maple Shade, all of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed May 25, 1983, Ser. No. 498,018

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 141—1 **19 Claims**



1. The method of verifying the delivery of the proper container of a group of containers from a product-dispensing station to a particular product-receiving station, comprising:

providing respectively different machine-readable container-identifying means secured to said containers;

presenting one of said group of containers at said product-dispensing station;

machine-reading said container-identifying means of said one container at said product-dispensing station to produce first signals representative of said container-identifying means of said one container;

thereafter delivering said one container to said product-receiving station;

at said product-receiving station, machine-reading said container-identifying means of said one container to produce second signals representative of said container-identifying means secured to said one container; and

comparing said first and second signals to produce at said delivery station third signals indicating that said one container presented at said product-receiving station is said proper container.

7. Apparatus for enhancing the reliability of delivery of an ingredient into a particular blending kettle at a kettle station, from an ingredient-dispensing station remotely positioned with respect to said kettle, comprising:

a transport container having container-identifying machine-readable indicia means secured thereto;

first indicia-reading means at said ingredient-dispensing station for reading said machine-readable indicia means to produce first signals representative thereof;

second indicia-reading means at said kettle station for reading said machine-readable indicia means to produce second signals representative thereof;

means for storing said first signals and for comparing them with said second signals to produce third signals only if said first and second signals represent the same machine-read indicia;

transfer inhibiting means for inhibiting the transfer of ingredients from said transport container to said blending kettle; and

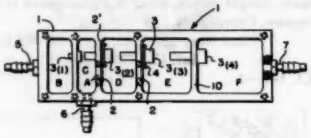
control means for controlling said transfer inhibiting means to permit said transfer upon the occurrence of said third signals.

4,554,956

EJECTOR DEVICE AND METHOD FOR PRODUCING SAME

Dan Greenberg, 4 Rehov Haganim, Kiryat Bialik, Israel

Filed Oct. 12, 1983, Ser. No. 541,060
Claims priority, application Israel, Oct. 18, 1982, 67012
Int. Cl.[4] B65B *31/04*; B21D *53/00*; F16K *1/00*
U.S. Cl. 141—65 **8 Claims**



1. A method for producing an ejector device with plural ejector chambers provided in a common ejector housing having inlet and outlet ports for a pressure medium and an evacuation inlet port communicating with one of the chambers, and plural ejector nozzles positioned coaxially in respective housing partitions separating relatively adjacent ejector chambers for interconnecting such chambers, said method comprising the steps of:

producing the housing with ejector chambers of substantially rectangular shape being formed therein in a coaxial and successive arrangement with adjacent chambers being separated by a respective common transverse partition;

forming communication openings in the transverse partitions between adjacent chambers;

drilling holes through end walls of the housing and co-axial holes through the transverse partitions between adjacent chambers for accommodation of ejector nozzles;

inserting ejector nozzles into the holes in respective transverse partitions;

installing valve flaps to cover respective communication holes;

closing the housing by securing and sealing with a top cover; and

providing at respective operative positions in the housing pressure medium inlet and outlet ports in communication with respective different chambers and an evacuation inlet port in communication with one of the chambers.

8. An ejector device made in accordance with the method of claim 1.

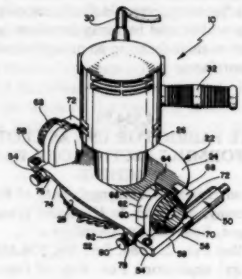
4,554,957

ROTARY RESURFACING TOOL

Charles Zayat, 100 New Hampshire St., Cranston, R.I. 02920

Filed Feb. 10, 1984, Ser. No. 578,855
Int. Cl.[4] B27C *9/02*
U.S. Cl. 144—2 R **5 Claims**

1. A rotary tool for resurfacing a work surface such as a painted shingle or clapboard wall defining a generally flat vertically oriented major surface and an adjacent overlying horizontally oriented minor surface, said tool comprising a housing, a rotatable cutting disc having a generally planar face and a peripheral edge surface, said disc rotatably supported by said housing and means for rotating said disc at high speed about an axis substantially perpendicular to said major work surface, said generally planar disc face having upwardly extending first cutting surfaces provided thereon and said disc peripheral edge surface having radially outwardly extending second cutting surfaces provided thereon such that said rotation permits simultaneous cutting of said major surface by said first cutting surfaces and said minor surface by said second cutting surfaces, said housing further including first and second



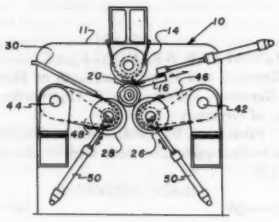
adjustable guide means adapted to respectively and simultaneously engage said major and minor surfaces so as to regulate the depth to which said disc cuts said major and minor surfaces.

4,554,958

APPARATUS FOR ROUNDING THE CIRCUMFERENCE OF A LOG

Charles J. Schmidt, Diboll, Tex., assignor to Arthur Temple, III, Austin, Tex., a part interest

Filed May 17, 1984, Ser. No. 611,250
Int. Cl.[4] B27L *1/00*; B27C *9/04*
U.S. Cl. 144—4 **17 Claims**



1. An apparatus for rounding the circumference of a wood log comprising,

first and second rotatable rollers adapted to engage the outside of a wood log at two spaced points between the ends of the log,

a knife positioned adjacent the first and second rollers and extending the length of the log for cutting off an amount of material from the outer circumference of the log for making the outer circumference of the log more uniformly round,

third and fourth movable rollers positioned below the first roller, and movable toward and away from the first roller and each other,

fifth and sixth movable rollers positioned below the second roller, and movable toward and away from the second roller and each other, and

means for rotating all of said rollers thereby rotating a log positioned between the rollers allowing the knife to cut off predetermined portions of the log extending outwardly for rounding the circumference of the log.

4,554,959

SURFACE TREATMENT OF SHEET MATERIAL

Olof R. Smedberg, Halmstad, Sweden, assignor to RY AB, Fack, Oskarstrom and AB Wilh. Becker, Fack, Stockholm, both of, Sweden

Continuation-in-part of Ser. No. 396,028, Jul. 7, 1982, abandoned. This application May 9, 1984, Ser. No. 608,368
Claims priority, application Sweden, Jul. 10, 1981, 8104317
Int. Cl.[4] B05D *1/36;* B27M *1/00*
U.S. Cl. 144—380 7 Claims

1. A method of providing a pore-sealed surface on sheet material comprising the steps of:

(a) coating a surface of said sheet material with a first layer of pore-sealing and surface forming lacquer;

(b) heating said lacquer at a first temperature providing drying and curing of said lacquer; and,

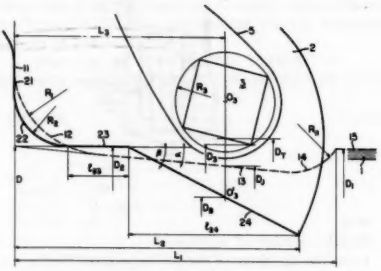
(c) heating said lacquer at a second temperature to the depth of the lacquer layer and limiting the heating of the remainder of the sheet material, while compressing said coated sheet to cause at least said lacquer to flow sufficiently to seal the pores of said lacquer and sheet surface and effect a smooth surface finish without damaging said sheet material.

4,554,960

RADIAL CARCASS TIRE WHICH CAN BE PARTICULARLY USED WITHOUT AN INDEPENDENT INNER TUBE

Jean-Pierre Pompier, Enval, France, assignor to Compagnie Generale des Etablissments Michelin, Clermont-Ferrand, France

Filed May 3, 1984, Ser. No. 606,753
Claims priority, application France, Jun. 23, 1983, 83 10543
Int. Cl.[4] B60C *15/02, 15/00*
U.S. Cl. 152—450 6 Claims



1. A tire without an independent inner tube, having a radial carcass reinforcement, a crown reinforcement formed of at least two plies of cables which are parallel in each ply and crossed from one ply to the next, and two beads each reinforced by at least one bead ring around which the carcass reinforcement is anchored, which can be mounted on a standard rim provided, between the well base and the frustoconical bead seat, with a circumferential hump having radially a cylindrical generatrix, characterized by the fact that,

on the one hand, the base of the beads, of an axial width L_2, has, seen in radial section and from the equatorial plane towards the outside of the tire, a profile comprising a frustoconical zone having an axial width l_{24} of between 0.45 L_2 and 0.65 L_2, the generatrix of which forms with the axis of rotation of the tire an angle β such that the value of the tangent of the angle β is between 0.5 and 0.6; a cylindrical zone having an axial width l_{23} of between 0.15 L_2 and 0.25 L_2 and having a diameter D_2 equal to the diameter D_1 of the cylindrical hump of the rim; and a circular arc connecting zone between the cylindrical zone and the vertical wall of the bead;

and on the other hand, the reinforcing bead ring, seen in radial section, has an interior diameter D_3 at least equal to the diameter D_1 of the cylindrical hump of the rim but at most equal to 1.004 times said diameter, and a cross section, the circumscribed circle of which has its center located, axially with respect to the vertical wall of the bead, at a distance away L_3 such that the ratio

$$s = \frac{D_J - D_B}{D_T - D_B}$$

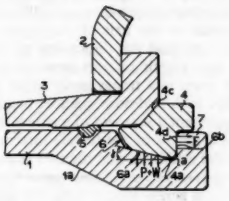
is at least equal to 0.45, D_J, D_B, D_T being the diameter of the rim, the diameter of the base of the bead and the diameter of the bead ring, respectively, measured in a plane parallel to the equatorial plane of the tire and passing through said center.

4,554,961

WHEEL RIM WITH SPLIT LOCKING RING

Shigeru Osawa, Tokyo, and Hisayoshi Yamoto, Yamato, both of Japan, assignors to Topy Industries Limited, Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,573
Claims priority, application Japan, Dec. 11, 1981, 56-199551
Int. Cl.[4] B60B *25/04*
U.S. Cl. 152—410 5 Claims



1. A wheel rim assembly comprising

an annular rimbase for a pneumatic tire,

a bead seat band,

a lockring groove defined by the rimbase,

a lockring located in said lockring groove interconnecting said annular rimbase and said bead seat band,

said lockring groove having a first bottom surface inclined at a predetermined angle of between 5° and 20° with respect to the axis of said annular rimbase and a vertical side wall portion,

said lockring having a second bottom surface substantially abutting said first bottom surface and an outer side wall portion substantially abutting said vertical side wall portion,

said bead seat band having a first inclined conical surface,

a second inclined conical surface defined by said lockring abutting said first inclined conical surface,

a first edge portion defined by said lockring groove located between said first bottom surface and said vertical side wall portion, and

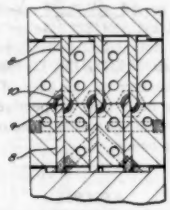
a second edge portion defined by said lockring located between said second bottom surface and said outer side wall portion,

said second edge portion being spaced from said first edge portion for dividing a force between axial side pressure forces transferred from said outer side wall portion to said vertical wall portion and radial pressure forces transferred from said second bottom portion to said first bottom portion when said pneumatic tire is inflated, the spacing between said first edge portion and second edge portion prevents movement of said lockring out of said lockring groove by rolling when said force is divided.

4,554,962
METHOD AND APPARATUS FOR FORMING AN INTERNALLY SCREW-THREADED ARTICLE

David E. Wright, Evesham, England, assignor to Dynacast International Limited, Alcester, England

Filed Aug. 10, 1984, Ser. No. 639,393
Claims priority, application United Kingdom, Aug. 20, 1983, 8322468
Int. Cl.[4] B22D 29/00
U.S. Cl. 164—132 8 Claims



1. A method of casting or moulding an article having an internally screw-threaded hole in a mould cavity which is shaped to define the exterior contour of the article comprising introducing casting or moulding material into the mould cavity around a thread forming core consisting of two withdrawable flat core members which have a width which, measured in the same direction as the axis of the screw-threaded hole to be formed, is less than the dimension of the cavity in the said direction and which project towards one another into the cavity and meet in a transversely offset partially overlapping relationship, each said core member having a leading end face formed to present a segment of a screw thread which is a male image of a segment of the female internal screw thread to be formed in the article so that the two segments of screw thread form two diametrally opposite segments of a male image of the female internal screw thread to be formed in the article, withdrawing the core members from the mould cavity when the casting or moulding material has set and removing the article from the mould cavity.

4,554,963
METHOD AND APPARATUS FOR A FLUIDIZED BED HEAT EXCHANGER

Alton C. Goodwin, Northport; Mark T. Junglen, Irondale, and John S. Kent, Birmingham, all of Ala., assignors to Baker International Corporation, Orange, Calif.

Filed Aug. 19, 1983, Ser. No. 524,520
Int. Cl.[4] F28C 3/16; F28D 13/00
U.S. Cl. 165—1 21 Claims

1. An improved fluidized material heat exchanger comprising:

a. a plurality of substantially parallel tubes for passing a primary medium, each tube having respective upper and lower open end portions joined by a hollow intermediate portion;

b. a collection chamber enclosing said upper open end portions of the tubes and having an outlet conduit for passing said primary medium from the collection chamber;

c. a middle chamber enclosing the intermediate portions of the tubes for passing a secondary medium about the tubes, the middle chamber having at least one inlet conduit and at least one outlet conduit for said secondary medium, and the middle chamber being physically separated in a leak proof manner from the collection chamber;

d. a fluid chamber enclosing said lower open end portions of the tubes, the fluid chamber physically segregated in a leak-proof fashion from the middle chamber; and, said fluid chamber being adapted to contain a quantity of particulate matter which is inert with respect to said primary medium and which is of a size and shape such that said particulate matter can be fluidized by said primary medium and passed upwardly through the tubes without clogging the tubes and capable of descaling the interior surfaces of the tubes;

e. at least one side inlet conduit and a base inlet conduit at predetermined locations in the walls and base, respectively, of said fluid chamber for concurrently receiving and passing said primary medium to the interior of said fluid chamber;

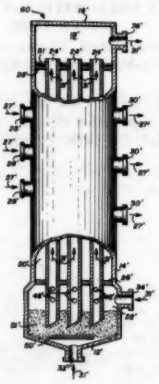
f. at least one of said second end portions of the tubes is a tube inlet device having a side wall with at least two apertures, one at an elevation above the other, said apertures being of a size and shape so as to permit unrestricted passage of said particulate matter and said primary medium through the apertures, and the tube inlet device has a hollow tip portion through which said primary medium and said particulate matter may pass; and

g. the size and location of said apertures is determined by the equations:

$$\tfrac{1}{4}D_N \leq A_N \leq [L-\tfrac{1}{4}D_N];$$

and

$$0.004[OD^2\pi \leq [D_1^2+D_2^2+D_3^2+\ldots D_N^2] \leq 3[OD^2]$$



with

N = the number of apertures;

D_N = the diameter of the Nth aperture;

OD = the overall diameter of the tube inlet devices;

L = the overall length of the tube inlet devices; and

A_N = the distance from the lower edge of the tube inlet device to the center point of the Nth aperture.

2. A method for descaling tubes and regulating the amount of fluidized particulate matter in a fluidized bed heat exchanger having a plurality of hollow parallel tubes for passing a primary medium into a collection chamber through a middle chamber from a fluid chamber while a secondary medium is passed through the middle chamber and bathes said tubes, said collection chamber incorporating at least one outlet conduit for passing said primary medium, said fluid chamber being subdivided into a primary region and a secondary region by a partition wall such that said two regions are physically isolated from each other in a leak proof manner, said primary region having a side inlet conduit mounted in the side of said fluid chamber, said secondary region having a base inlet conduit mounted in the base of said fluid chamber, said tubes extending through said primary region and terminating in said secondary region, the portion of the tube in said primary region having portions defining at least two apertures aligned parallel to the

central axis of the tube such that primary medium entering the primary region via side inlet conduit can pass into the tubes via the apertures and in said secondary region is a bed of particulate matter for cleaning the interior surfaces of the tubes which is capable of being fluidized by the primary medium and passing into the tubes from said secondary region, comprising the steps of:

introducing said primary medium simultaneously into the side and base inlet conduits under pressure when descaling is desired, and substantially filling the primary region with said primary medium passing through the side inlet conduit to cause said primary medium to pass into said tubes through the tube inlet device apertures, and causing the primary medium passing through the base inlet conduit to fluidize said particulate matter residing within the secondary region;

passing said fluidized particulate matter in said secondary region up into the tubes to comingle with said primary medium entering said tubes through the tube inlet device apertures located in the primary region, passing said commingled medium through said tubes to said collection chamber to descale said tubes;

discharging said commingled medium from said collection chamber;

flowing a secondary medium through said middle chamber and bathing the outer surfaces of the tubes so as to heat or cool the tubes as desired; and

reducing the flow of said primary medium to the base inlet conduit to prevent particulate matter from said secondary region from being fluidized and entering said inlet devices while maintaining the flow of the primary medium entering the heat exchanger via the side inlet conduit when descaling is not desired.

4,554,964

METHOD FOR CONTROLLING TEMPERATURE OF WATER TO BE FED INTO WATER COOLING TOWER

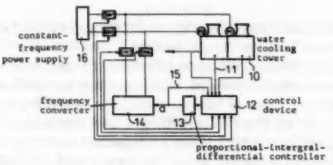
Koichi Awano, Kasukabe; Yoshifumi Nitta, Ibaraki, and Satoshi Ibe, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Niigata Kisetsu Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 579,018

Claims priority, application Japan, Feb. 24, 1983, 58-28458

Int. Cl.[4] F25B *39/04*

U.S. Cl. 165—39 **1 Claim**



1. A method for controlling temperature of water fed into a water cooling tower by regulating the rotational speeds of cooling fans which comprises detecting a sum of actual rotational speeds of a plurality of motors which drive a plurality of cooling fans, comparing the detected sum of the rotational speeds with a predetermined rotational speed which is substantially equal to a sum of rotational speeds of said motors when said motors are driven in parallel by a frequency converter with its maximum power capacity, driving some of said motors by a constant-frequency power supply and driving the other of said motors by said frequency converter when the sum of the actual rotational speeds is in excess of said predetermined speed, and carrying on parallel operation of all of said motors by said frequency converter when the sum of the actual rotational speeds is less than said predetermined rotational speed, whereby a frequency conversion rate of the frequency converter is continuously controlled so that the frequency applied to said motors is varied so as to control the actual rotational speeds of said motors, thereby regulating the amount of air generated by said plurality of cooling fans and thus maintaining the temperature of water to be fed into said water cooling tower at a constant level.

4,554,965

BALL-MEASURING SYSTEM FOR SELF-CLEANING HEAT EXCHANGER

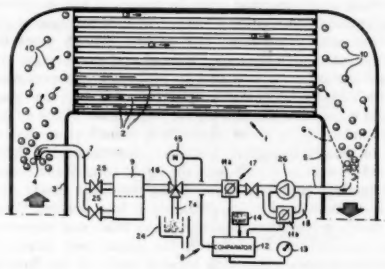
Rolf Bochinski, Duisburg; Klaus Eimer; Alois Lange, both of Ratingen, and Xuan L. Nghiem, Krefeld, all of Fed. Rep. of Germany, assignors to Taprogge Gesellschaft mbH, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,280

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309509; May 3, 1983, 3316020

Int. Cl.[4] F28G *1/12*

U.S. Cl. 165—95 **10 Claims**



1. A method of operating a tube-type heat exchanger having intake and output conduits and tubes connected therebetween, and a return conduit extending from the output to the inlet conduit, the method comprising the steps of:

passing a coolant liquid from the intake to the output conduit through the tubes;

releasing balls into the intake conduit from the return conduit and passing the balls with the coolant through the tubes to clean same;

trapping balls in the output conduit and introducing them into the return conduit;

measuring the momentum of each of the balls in the return conduit and generating respective outputs corresponding thereto;

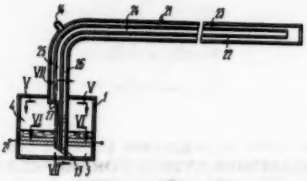
comparing the outputs with a set-point signal corresponding to minimum acceptable ball momentum; and

withdrawing from the return conduit a ball whose momentum is below the minimum momentum and replacing the withdrawn ball in the conduits with a fresh ball.

4,554,966
HEAT-TRANSFER DEVICE

Leonard L. Vasiliev, ulitsa Kulman, 13, kv. 48.; Vladimir G. Kiselev, ulitsa Koltsova, 32, kv. 137.; Valery A. Morgun, ulitsa Slavinskogo, 35, Kv. 40.; Anatoly M. Marchenko, Leninsky prospekt, 72a, kv. 73., all of Minsk; Evgeny A. Rudnev, ulitsa Krasnoarmeiskaya, 8/10, kv. 23., Kharkov; Vasily A. Nesvit, ulitsa Sverdlova, 119, kv. 49., Kharkov; Leonid M. Dunaevsky, ulitsa Dzerzhinskogo, 59, kv, 50., Kharkov; Nikolai F. Tverdokhleb, Merfyanskoe shosse, 30, kv. 50., Kharkov; Vladimir M. Bogdanov, Leninky prospekt, 127, kv. 89., and Mikhail I. Rabetsky, ulitsa P. Glebki, 84, kv. 204., both of Minsk, all of U.S.S.R.

Filed Jun. 2, 1983, Ser. No. 500,254
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.21 **7 Claims**



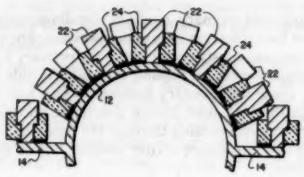
1. A heat-transfer device, comprising an evaporation chamber; a space of said evaporation chamber having a liquid zone and a vapor zone; at least one heating source for said evaporation chamber; a condensation chamber made in the form of a pipeline and installed essentially horizontally along an object to be heated; a space of said condensation chamber; a tube used for supplying vapor into the space of said condensation chamber and for returning the condensed liquid into the space of said evaporation chamber arranged in the space of said condensation chamber along its longitudinal axis, the space of said tube being communicated with the spaces of said evaporation chamber and condensation chamber; at least two branch pipes, fluid-flow and vapor-flow; one of said branch pipes being communicated with the vapor zone of said evaporation chamber and the other of said branch pipes being communicated with the liquid zone of said evaporation chamber, the space of the tube is communicated with the vapor zone of the evaporation chamber through the vapor-flow branch pipe, while the space of the condensation chamber is communicated through the fluid-flow branch pipe with the liquid zone of the evaporation chamber; dividing means being mounted inside of the fluid-flow branch pipe for directing a heat carrier, flowing from said condensation chamber, away from said vapor zone of the evaporation chamber into the liquid zone thereof; the vapor-flow branch pipe being located inside of the fluid-flow branch pipe; said dividing means being formed as a half-ring closing an annular gap between walls of the vapor-flow branch pipe and the fluid-flow branch pipe through which the condensed heat carrier being returned into the evaporation chamber, said half-ring being mounted at an angle to the plates closing longitudinal gaps between said walls of the branch pipes.

4,554,967
EROSION RESISTANT WATERWALL

Richard C. Johnson, and Leigh B. Egbert, both of Dansville, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 10, 1983, Ser. No. 550,700
Int. Cl.[4] F28F *19/00*
U.S. Cl. 165—134.1 **4 Claims**

1. A waterwall comprising a plurality of water tubes extending in a spaced, parallel relationship; a plurality of continuous fins extending between adjacent tubes for the length thereof and connected to the outer surfaces of said tubes for forming a gas-tight structure, one surface of which is exposed to erosion-causing particulate material; and a plurality of erosion resistant stud members welded to said exposed surface of said structure, each stud member comprising a cylindrical member, a projecting portion extending from said cylindrical member and having a diameter less than that of said cylindrical member for

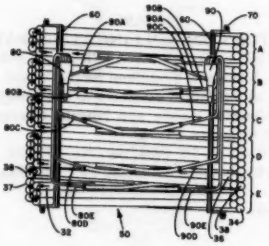


melting during said welding, and a ceramic sleeve extending around said cylindrical member and said projecting portion; the size of said stud members relative to said tubes being such that a plurality of said stud members extend around the periphery of each exposed tube surface in a spaced relationship.

4,554,968
WRAPPED FIN HEAT EXCHANGER CIRCUITING

Rudy E. Haas, East Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 29, 1982, Ser. No. 344,141
Int. Cl.[4] F28F *9/26, 17/00;* F25B *13/00*
U.S. Cl. 165—144 **1 Claim**



1. A refrigerant carrying circuit forming a portion of an air to refrigerant heat exchanger having a plurality of refrigerant carrying circuits connected to a first header means and a second header means in parallel which portion comprises:

a plurality of loops of tubing, each loop extending about the perimeter of the heat exchanger and the tubing being a wrapped fin tubing having a refrigerant carrying tube and fin material wrapped about the exterior of the tube;

an outer portion of the circuit formed from a set of loops located to form an outer set of loops including a top, a bottom and a plurality of intermediate loops;

an inner portion of the circuit formed from a set of loops located within said outer set of loops to form an inner set of loops including a top, a bottom and a plurality of intermediate loops and spaced inwardly from the outer set of loops;

said first header means connected to one of said intermediate loops of said inner set of loops;

said second header means connected to one of said intermediate loops of said outer set of loops; and

transition means connecting the outer set of loops to the inner set of loops at the top, at the bottom and at an intermediate loop of each set of loops wherein refrigerant is supplied from the first header means to said one intermediate loop of said inner set of loops first and then flows downwardly through the inner set of loops to the transi-

tion means connecting said bottoms and then upwardly through the outer set of loops to the transition means connecting said intermediate loops of each set of loops and then upwardly through a portion of the inner set of loops to the transition means connecting said tops and then downwardly through the outer set of loops to the connection to the second header means.

4,554,969

COAXIAL FINNED TUBE HEAT EXCHANGER

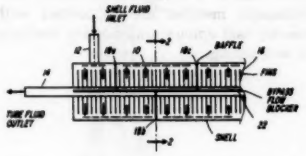
Theodore C. Carnavos, Bethel, Conn., assignor to Noranda Metal Industries, Inc., Newton, Conn.

PCT No. PCT/US82/01784, § 371 Date Aug. 20, 1984, § 102(e) Date Aug. 22, 1984, PCT Pub. No. WO84/02572, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 22, 1982, Ser. No. 648,571

Int. Cl.⁴ F28D *7/10*; F28F *9/22, 13/06*

U.S. Cl. 165—154 **8 Claims**



1. A coaxial finned tube heat exchanger comprising a hollow shell, a tube mounted coaxially within such shell and having radially extending outer fins of substantially large radial dimension in relation to the tube diameter, means for passing a first heat exchanger fluid in said tube, and means for passing a second heat exchanger fluid through said shell, characterized in that a plurality of segmental cut baffles are mounted between adjacent fins at a predetermined spacing within said shell so as to achieve a cross-flow pattern for said second fluid between the fins of said tube, and in that a pair of bypass flow blockers are mounted longitudinally on the tip of the fins to block circumferential flow of said second fluid between said shell and the tips of the fins and so force the fluid flow between the fins.

4,554,970

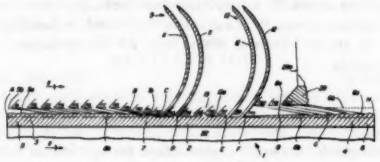
HEAT EXCHANGERS AND METHOD OF MAKING SAME

Stephen F. Pasternak, Palm Harbor, Fla., and Franz X. Wohrstein, Chicago, Ill., assignors to Peerless of America, Inc., Chicago, Ill.

Filed Jun. 10, 1982, Ser. No. 386,950

Int. Cl.⁴ F28F *1/26*

U.S. Cl. 165—181 **4 Claims**



1. A heat transfer element comprising

a. an elongated tubular member having a horizontal center line therein,

b. said tubular member having a top and bottom wall integral therewith, said top wall and said bottom wall each having a substantially rectangular-shaped facing thereon,

c. at least two groups of fins spaced from each other longitudinally along both of said top and bottom walls, each group comprising a plurality of cut fins, said cut fins spaced from each other longitudinally therealong, with said at least two groups of fins along both of said top and bottom walls having a spacing therebetween formed by predetermined severing of the cut fins and providing fin stubs thereon, with the outer surface of said spacing therebetween defined by said severed fin stubs presenting substantially a horizontal outer plane surface with respect to said horizontal center line of said tubular member,

d. each of said fins in each of said groups

(1) being spaced from the next adjacent fin a predetermined distance longitudinally along both said top and bottom walls, and

(2) projecting outwardly from said face, said groups of fins being spaced from each other a distance greater than said predetermined distance longitudinally along said wall,

e. said tubular member further having two oppositely disposed end portions adjacent one of said group of fins on both said top and bottom walls,

f. each of said end portions having

(1) an inner surface portion sloping upwardly and outwardly from the respective adjacent group of said fins, and

(2) an outer surface portion extending outwardly from said inner portion thereof in substantially parallel relation to the center line of said tubular member.

4,554,971

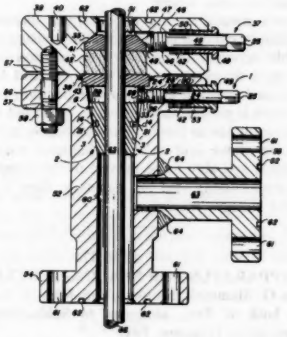
TUBING ANCHOR ASSEMBLY

William O. Cobb, Rte. 4, Box 327, Haughton, La. 71037

Filed Oct. 26, 1983, Ser. No. 545,530

Int. Cl.⁴ E21B *19/10*

U.S. Cl. 166—88 **25 Claims**

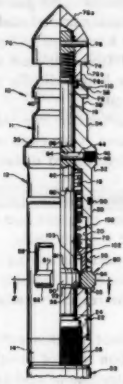


1. A tubing anchor assembly for supporting tubing in a well comprising tubing support means having an internal bore and a tapered slip bowl in said bore; a plurality of retainer means threadably and radially deployed in said tubing support means in spaced relationship and shaped ends on said retainer means, said shaped ends projecting into said slip bowl; a plurality of slip means disposed in said slip bowl and dove tail slot means provided in said slip means, said slot means engaging said shaped ends on said retainer means, respectively, whereby said slip means are suspended on said shaped ends in a first selected orientation and are released from said shaped ends and dropped into supporting contact with the tubing responsive to threadable rotation of said retainer means in said tubing support means, in a second selected orientation.

4,554,972
WELL TOOL LOCKING DEVICE

David T. Merritt, Celina, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 30, 1984, Ser. No. 605,215
Int. Cl.[4] E21B 23/02
U.S. Cl. 166—137 8 Claims



1. A locking device for releasably locking a well tool in a receptacle in a well conduit, said receptacle having a bore with a locking recess providing a downwardly facing lock shoulder, said locking device comprising:

a. tubular housing means having means at its uppper end for attachment to a running tool and means at its lower end for attachment of a well tool, said housing means having window means intermediate its ends;

b. lug means in said window means movable between expanded locking and retracted released positions, said lugs being also movable between upper and lower positions in said window means;

c. core means having an enlarged diameter portion and slidably carried in said tubular housing means and movable between an initial lower position in which said enlarged diameter portion supports said lug means in expanded position and an upper position in which said lug means is permitted to move to retracted position, said lug means when in their upper position in said window means being above said enlarged diameter portion of said core means and able to be moved to retracted position, and

d. means biasing said lug means to their lower positions in said window means.

4,554,973
APPARATUS FOR SEALING A WELL CASING

Clinton O. Shonrock, Stafford, and John O. Wambaugh, Houston, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

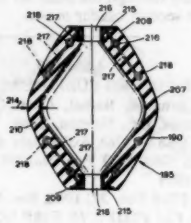
Filed Oct. 24, 1983, Ser. No. 544,658
Int. Cl.[4] E21B 33/128
U.S. Cl. 166—192 9 Claims

1. An elastomeric sealing element for a bridge plug for use within a well casing and production tubing, the diameter of the production tubing being smaller than the diameter of the well casing, comprising:

a generally tubular-shaped elastomeric member having first and second ends and a unitary wall portion therebetween;

the elastomeric member having a normal, unstressed configuration, wherein the diameter thereof varies along the longitudinal axis of the elastomeric member, with the diameter intermediate the ends of the elastomeric member being larger than the diameter at the ends of the elastomeric member;

the elastomeric member being elongatable along its longitudinal axis whereby the diameter intermediate the ends of the elastomeric member is substantially the same as the diameter of its ends so that the elastomeric member may pass through the production tubing; and



the elastomeric member being compressible along its longitudinal axis to a configuration where said ends of said elastomeric member are in contact with each other whereby said unitary wall portion sealingly conforms to the well casing.

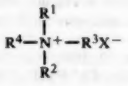
4,554,974
METHOD OF ENHANCED OIL RECOVERY EMPLOYING THICKENED AMPHOTERIC SURFACTANT SOLUTIONS

Bayram Kalpakci, Sagamore Hills, and Keng S. Chan, South Euclid, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 8, 1983, Ser. No. 559,524
Int. Cl.[4] E21B 43/22
U.S. Cl. 166—273 14 Claims

1. A method for recovering petroleum from a subterranean reservoir penetrated by injection well means and spaced production well means comprising

injecting into said reservoir through said injection well means a surfactant slug comprising an aqueous solution containing: about 0.001 to about 5% by weight of an amphoteric surfactant of the formula



wherein R^1 is a hydrocarbon-based group of 1 to about 14 carbon atoms, R^2 is a hydrocarbon-based group of 1 to about 5 carbon atoms, R^3 is a divalent hydrocarbon-based group of 1 to about 3 carbon atoms, and R^4 is represented by the formula

wherein R^9 is a hydrocarbon-based group of about 6 to about 26 carbon atoms, R^{10} is a divalent hydrocarbon-based group of about 2 to about 18 carbon atoms and y is an integer of 1 to about 4, and X is SO_3— or COO—; and an effective amount of a high molecular weight homopolysaccharide gum thickener derived from fungus strains of the genus Schlerotium to provide said surfactant slug with a viscosity exceeding the viscosity of said petroleum in said reservoir, and

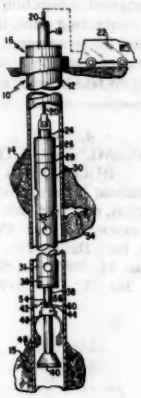
recovering fluid from said production well means.

4,554,975

HOLD DOWN APPARATUS FOR WIRELINE OPERATED GUN

Roy R. Vann, Houston, and Flint R. George, Katy, both of Tex., assignors to GEO VANN, Inc., Houston, Tex.

Filed Jun. 7, 1982, Ser. No. 385,528
Int. Cl.[4] E21B *43/119*
U.S. Cl. 166—297 12 Claims



12. Apparatus for releasably anchoring a wireline operated perforating gun within a cased and substantially dry borehole, comprising:

an elongate member depending from said gun;

a support member reciprocably disposed on said elongate member;

a plurality of drag springs having one end affixed to said support member;

slip means affixed to the other end of said drag springs movable from a first position where said slip means anchors against the cased borehole to a second position where said slip means does not engage the cased borehole;

cooperable reciprocable means disposed on said support member and said member for reciprocating said slip means between said first and second positions;

cooperable means disposed on said elongate member for actuating said reciprocable means; and

a conical member disposed on said elongate member for moving said means into engagement with the cased borehole.

4,554,976

TEST TOOL FOR SUBSEA BLOWOUT PREVENTER STACK

Joseph H. Hynes, Houston; Charles D. Morrill, Humble, and George D. Hall, Bellaire, all of Tex., assignors to Hydril Company, Los Angeles, Calif.

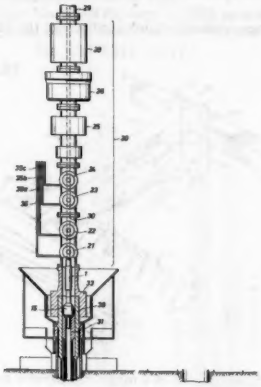
Filed May 12, 1983, Ser. No. 494,038
Int. Cl.[4] E21B *23/00*
U.S. Cl. 166—341 26 Claims

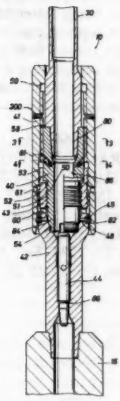
1. A test tool adapted for use during testing of a subsea blowout preventer stack attached to a wellhead comprising,

upper body means having means at its upper end for connection to the end of a drill pipe, the upper body means having an axial bore communicating with the interior of the drill pipe,

lower body means having an axial bore therein and having at its lower end means for connecting to a wellhead sealing tool means for sealing between the lower body means and the wellhead, and

releasable and reconnectable coupling means for connecting the lower body means to the upper body means in a first connection, the axial bore of the upper body means being in fluid communication with the axial bore of the lower body means, for disconnecting the lower body means from the upper body means by turning the drill pipe in a direction tending to tighten drill pipe joints while axially





moving the drill pipe solely in one direction, and for reconnecting the upper body means to the lower body means in a seconnd connection without removing the drill pipe from the well by turning the drill pipe in the same direction.

4,554,977

COMBINED HARROW AND HARROW BAR

Bertrand Vachon, Thetford Mines, Canada, assignor to Ber-Vac Inc., Thetford Mines, Canada

Filed Mar. 16, 1984, Ser. No. 590,266
Int. Cl.[4] A01B *49/02*
U.S. Cl. 172—177 1 Claim

1. A cultivator comprising:

a main frame;

a first support means pivotally mounted on the frame and extending rearwardly therefrom, said first support means carrying an upwardly and rearwardly extending arm adjacent the frame;

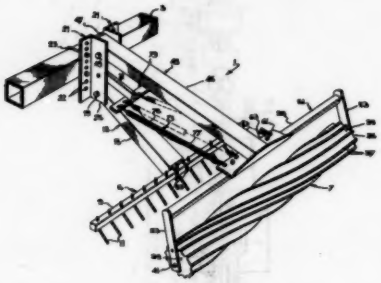
a harrow bar mounted rearwardly on the first support means;

a second support means pivotally mounted on the frame and

extending rearwardly therefrom above the first support means;

a cylindrical harrow mounted rearwardly on the second support means and spaced rearwardly from the harrow bar, said cylindrical harrow having helical blades thereon; and

at least one resilient means connecting the harrow bar to the



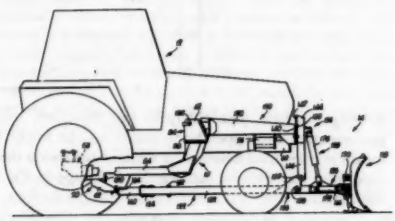
cylindrical harrow in a manner whereby movement of the harrow bar in an upward direction automatically increases the downward pressure applied by the cylindrical harrow, said resilient means being fastened at one end to the arm carried by said first support means and at its other end to the second support means near the cylindrical harrow, said resilient means comprising a spring attached at one end to one end of a length of chain.

4,554,978

QUICK ATTACH TRACTOR MOUNTING ASSEMBLY FOR AGRICULTURAL DOZER AND LOADER IMPLEMENT

David E. Schneider, Great Bend, Kans., assignor to Great Bend Manufacturing Co., Inc., Great Bend, Kans.

Filed Mar. 27, 1984, Ser. No. 593,885
Int. Cl.[4] E02F 3/76
U.S. Cl. 172—247 **6 Claims**



1. In combination:

an assembly adapted to be affixed to a tractor and operable for quickly and alternately mounting first and second, different types of implements to the tractor, said assembly including

a pair of elongated rails for securement to the forward end of said tractor on opposed sides thereof and extending fore and aft of the tractor; and

bracket means for securement to the underside of said tractor in a position adjacent the rearward end of said tractor and approximal to the center thereof;

first and second, different implements each including a material handling element, a pair of elongated, laterally spaced apart connecting arms oriented for straddling the forward end of said tractor and engaging said rails, said connecting arms being in the form of respective channels for telescopically receiving corresponding adjacent rails, and means operatively connecting said arms to said element; and

means for alternately and releasably coupling said first and second implements to at least certain portions of said assembly, including structure for releasably securing each of said arms to a corresponding adjacent rail,

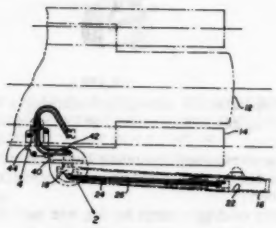
said second implement being a dozer, said element forming a part of said dozer comprising a dozer blade, said dozer including an elongated connection leg positioned between and below said connecting arms, the rearmost end of said leg being adapted for securement to said bracket means, said coupling means including structure for releasably securing said leg to said bracket means.

4,554,979

CONDUIT ARRANGEMENT FOR TILT CYLINDER OF A BULLDOZER

Robert W. Foley, Addison; Robert C. Storck, Wheaton, both of Ill.; Donald J. Mickus, deceased, late of Chicago, Ill., and by Debbie Pastors, executrix, Oak Park, Ill., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 11, 1984, Ser. No. 619,083
Int. Cl.[4] E02F 3/76
U.S. Cl. 172—813 **3 Claims**



1. A conduit arrangement for a tilt cylinder of a bulldozer having a track frame and a push arm connected to said track frame for operating the blade of the bulldozer, said arrangement comprising:

a trunnion for pivotally connecting the push arm to the track frame and including a pair of spaced bores defining a pair of spaced fluid passages provided therethrough;

first conduit means having one end coupled to said tilt cylinder and the other end connected to said fluid passages, said first conduit means passing through an internal bore provided through said push arm;

the inboard end of said trunnion extending into the interior of said track frame, with said fluid passages extending through said trunnion into the interior of said track frame;

second conduit means passing inwardly through said track frame towards the main frame of said bulldozer and having one end connected to said fluid passages and the other end extending into said bulldozer main frame, said track frame being spaced from said bulldozer main frame;

a generally hollow coupling spanning the space between said main frame and said track frame and defining a protective housing for the second conduit means passing therethrough;

flexible mounting means for connecting the ends of said coupling to said track and main frames to permit relative motion between said two ends in the vertical, horizontal and lateral planes, said flexible mounting means including resilient means circumferentially surrounding the coupling including a first resilient member provided at the coupling track frame end, and a second resilient member provided at the coupling main frame end; and

a hydraulic control valve connected to the other end of said second conduit means for controlling the flow of fluid

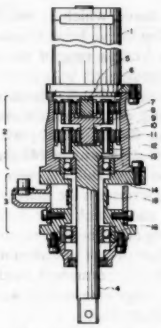
through said first and second conduit means to and from said tilt cylinder.

4,554,980

NUT RUNNER USING INDUCTION MOTOR

Tabito Doniwa, Hachioji, Japan, assignor to Daiichi Dentsu, K.K., Chofu, Japan

Filed Jul. 19, 1983, Ser. No. 515,364
Claims priority, application Japan, Oct. 13, 1982, 57-178562
Int. Cl.[4] B23Q *5/12*
U.S. Cl. 173—12 4 Claims



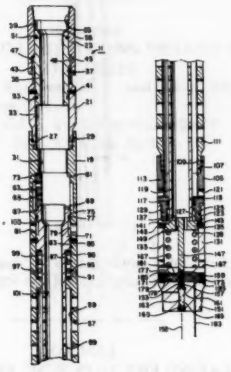
1. In a nut runner for tightening screwed objects comprising:
a driving motor,
a driving shaft to be coupled to said screwed objects for driving the same,
a reduction gear mechanism provided for transferring the revolution of said driving motor to said driving shaft,
a torque detector for detecting a torque applied to said driving shaft, and
a control circuit for controlling said driving motor by the use of the detected output of said torque detector,
said driving motor being a two-phase induction motor having a rotor and field coils, and said control circuit comprising means to control the magnitudes, repetition frequency and phase relations of intermittent currents supplied to field coils of said two-phase induction motor so that the torque of the two-phase induction motor is controlled by control of the magnitude of the intermittent currents, the revolution speed of the two-phase induction motor is controlled by control of the repetition frequency of the intermittent currents and the forward and backward driving directions are switched by the switching of phase relations of the intermittent currents,
said control circuit comprising means operating said motor at high speed during a first stage of tightening said screwed object, decelerating and quickly stopping said motor when the torque detected by said torque detector reaches a first pre-set reference value, immediately restarting said motor and operating it in the same direction at a lower speed during a second stage of tightening said object, and braking said motor to a sudden stop when the torque detected by said torque detector reaches a second pre-set reference value higher than said first reference value.

4,554,981

TUBING PRESSURIZED FIRING APPARATUS FOR A TUBING CONVEYED PERFORATING GUN

David L. Davies, Abu Dhabi, United Arab Emirates, assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 518,910, Aug. 1, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 751,999
Int. Cl.[4] E21B *43/11*
U.S. Cl. 175—4.52 23 Claims



1. A tubing pressurized firing apparatus for a tubing conveyed perforating gun of the type used to perforate a cased well bore, comprising:
a tubular body having an upper end with upper connecting means for connecting said body in a well tubing string and having a lower end with lower connecting means for connecting said body to a well perforating gun;
actuator means located within said tubular body and responsive to changes in pressure within said well tubing string above said tubular body; and
cocking means located below said actuator means within said tubular body, said cocking means including a lockout member initially positioned between a detonating pin and a percussion detonator, said cocking means being actuable by said actuator means to move said lockout member from between said detonating pin and percussion detonator as tubing pressure is increased by a predetermined amount whereby subsequent release of tubing pressure exposes said detonating pin to said percussion detonator to actuate said detonator and fire said perforating gun.

4,554,982

APPARATUS FOR FORMING BOREHOLES

James A. Burton, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Aug. 3, 1984, Ser. No. 637,523
Int. Cl.[4] E21B *7/08*
U.S. Cl. 175—75 10 Claims

1. A drilling assembly adapted for drilling a borehole in an earth formation comprising,
a drill motor assembly having a drill bit driven by a shaft of a drill bit mud pressure driven motor means, and
a force on bit assembly connected in series with said drill motor assembly and having
an anti-rotation assembly means for preventing rotation with

respect to the borehole of said mud pressure driven motor means, and

an axial drive mud motor means for applying axial force to said drill bit as it turns against the formation in the borehole.

4,554,983

OSCILLATING FRICTION RING ASSEMBLY FOR APPLYING AXIAL THRUST TO A SHAFT

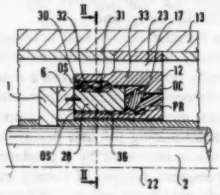
Georges Obrecht, Pont de Claix, France, assignor to Alsthom-Atlantique, Paris, France

Filed Jun. 27, 1984, Ser. No. 625,157

Claims priority, application France, Jun. 27, 1983, 83 10569; Aug. 3, 1983, 83 12808

Int. Cl.[4] E21B *4/02*

U.S. Cl. 175—107 **9 Claims**



1. An oscillating friction ring assembly for applying axial thrust to a shaft, the assembly comprising:

a first subassembly comprising rotary parts which are rotatable relative to an outer body and which are driven by a shaft which is itself rotatable about a shaft axis, the shaft axis defining an axial direction, and the first subassembly being suitable for transmitting axial thrust to the shaft; and

a second subassembly comprising non-rotary parts connected to the said outer body in such a manner as to prevent the non-rotary parts from rotating about the said axis while enabling the non-rotary parts to transmit axial thrust to the said outer body, the said first and second subassemblies co-operating with each other to prevent large axial displacement of the shaft relative to the body while allowing the shaft to rotate relative to the body;

the said first subassembly and the said second subassembly each including a respective friction ring having a plane friction surface lying in a plane substantially perpendicular to the said axis, each friction surface being in the form of a circular annulus disposed coaxially about the shaft and being made of a hard material, and the friction surface of each subassembly being disposed to bear against the friction surface of the other subassembly, with each friction ring of the second subassembly including only one friction surface located at an axial end face of the friction ring referred to as a "front" end face, and with the axially opposite end face of the friction ring being referred to as a "rear" end face;

the friction ring of the said second subassembly being mounted in co-operation with a corresponding resilient thrust member engaging the rear face thereof to urge the friction ring axially forwardly to bear continuously against the friction ring of the said first subassembly, thereby enabling small axial displacements of the said friction rings relative to the said outer body;

a frame constituting a rear thrust point for the resilient thrust member;

means being provided to prevent the friction ring of the second subassembly from rotating about the said shaft axis relative to the said frame, and to guide axial displacement of the friction ring;

the improvement wherein the said second subassembly further includes:

a moving guide sleeve which is movable relative to the frame, the moving sleeve being coaxial with the said shaft and having the friction ring of the second subassembly rigidly fixed thereto; and

a fixed guide sleeve which is fixed relative to the frame, the fixed sleeve being coaxial with and axially co-extensive with the moving sleeve, radial play being provided between the pair of sleeves to enable the moving ring to tilt slightly about an axis which is perpendicular to the said shaft axis, which intersects the shaft within the axial extent of the sleeves, and which may rotate about the shaft, where such tilting could be due, in particular, to the possibility of the surface of first subassembly friction ring being out-of-true, such that permanent axial thrust between the pair of friction rings transmits a wobble to the second subassembly friction ring;

the pair of sleeves including a plurality of pairs of adjacent ball-receiving housings hollowed out in their facing surfaces, with at least one of the housings in each pair being in the form of an axially extending groove;

a ball being placed in each of the said pairs of ball-receiving housings with sufficient play to enable easy axial sliding of the moving sleeve relative to the fixed sleeve by means of the balls rolling on the walls of the said grooves, but with the said play being small enough to prevent angular movement of the moving sleeve relative to the fixed sleeve about the axis of the said shaft, thereby constituting the said means for preventing the second subassembly friction ring from rotating, while additionally facilitating the said periodic tilting of the moving sleeve relative to the fixed sleeve;

ball-centering means being provided to cause the balls to be disposed around a circle which is coaxial with both the moving sleeve and the fixed sleeve when said sleeves are themselves coaxial, thereby enabling the moving sleeve to tilt about any tilt axis by appropriate movement of the balls in their housings.

4,554,984

DRILL BOX SUPPORT MECHANISM FOR MINING BOLTER MACHINES

Gary A. Hakes, Bristol, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

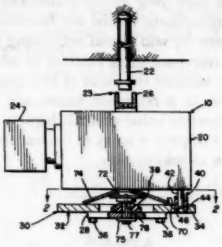
Filed Nov. 26, 1984, Ser. No. 674,781

Int. Cl.[4] E21C *11/00*

U.S. Cl. 175—170 **14 Claims**

1. A drilling mechanism for a mining bolter machine comprising:

a support plate connected to a mining bolter machine,
a spring washer mounted on the support plate,
a drill box resting on the spring washer, and



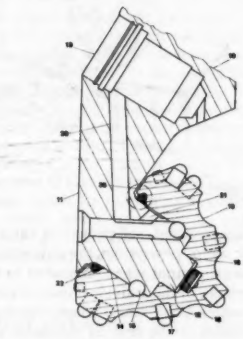
a means for preventing rotation of the drill box relative to the support plate.

4,554,985

ROTARY DRILL BIT

Lars K. Bäcklund, Sandviken, Sweden, assignor to Santrade Limited, Sandviken, Sweden

Filed Dec. 6, 1984, Ser. No. 678,776
Claims priority, application Sweden, Jan. 3, 1984, 8400015
Int. Cl.[4] E21B *10/22*
U.S. Cl. 175—371 **8 Claims**



1. In a rotary drill bit of the type comprising a head, at least one roller cutter rotatably mounted on said head by means of bearings for rotation about an axis, a chamber defined by a first sealing surface in said roller cutter and a second sealing surface in said head, and a radially oriented annular resilient seal disposed in said chamber in sealing engagement with said first and second sealing surfaces for isolating said bearings from ambient fluid, the improvement wherein:

said first sealing surface is generally V-shaped in cross-section as formed by first and second spaced apart side portions interconnected by an intermediate portion,

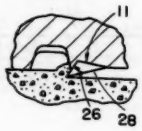
said side portions and intermediate portion pressing against said seal with sealing engagement being uninterrupted along said intermediate portion, said first and second side portions mutually diverging in a direction toward said second sealing surface and forming an acute angle therebetween and each oriented at an acute angle relative to the plane of said seal to define a region between said side portions which is smaller than a section of said seal disposed in said region when said seal section is measured in a relaxed state, so that said side portions pinch the corresponding sides of said seal section to impart a sealing pressure to said sides of said seal section which is greater than the maximum sealing pressure at said intermediate portion and resists movement of said seal section relative to said first sealing surface in directions within and laterally of said plane of said seal, and to produce a bulging of said seal toward a section of said second sealing surface located intermediate said side portions of said first sealing surface to produce a sealing pressure at said section of said second sealing surface which is greater than a maximum sealing pressure at said side portions of said first sealing surface.

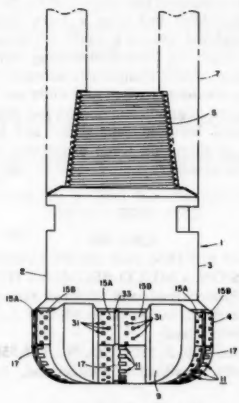
4,554,986

ROTARY DRILL BIT HAVING DRAG CUTTING ELEMENTS

Kenneth W. Jones, Kingwood, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Jul. 5, 1983, Ser. No. 510,693
Int. Cl.[4] E21B *10/54*
U.S. Cl. 175—397 **3 Claims**





1. A rotary drill bit for drilling a well bore comprising:

a bit body having a threaded pin at its upper end adapted to be detachably secured to drill pipe or the like for rotating the bit and for delivering drilling fluid under pressure to the bit body, an exit port in the bottom of the bit body for exit of drilling fluid under pressure from the bit body, and first and second ridges on the bottom of the bit body extending from adjacent the center to adjacent the periphery of the bottom of the bit body in spaced relation to each other thereby forming a watercourse therebetween in flow communication with said exit port;

a plurality of drag cutting elements mounted in side-by-side relation on the second ridge, each element being spaced from the elements adjacent thereto and projecting below the bottom of the second ridge to cutting edges engageable with the formation at the bottom of the well bore to form gaps between the cutting elements in fluid communication with the watercourse for flow of drilling fluid therethrough, each element further being of relatively

rigid material and immovably mounted on the second ridge so as to maintain its cutting edge at a relatively fixed position beneath the bottom of the second ridge, the bottom of the first ridge being spaced below the bottom of the second ridge but above the bottom of the cutting edges of the cutting elements, whereby the first ridge is adapted to engage the formation at the bottom of the well bore to limit the depth of penetration of the cutting elements into the formation and to block fluid flow between the first ridge and the formation, thereby causing the drilling fluid to exit said watercourse via said gaps for enhanced cleaning and cooling of the cutting elements by the drilling fluid.

4,554,987

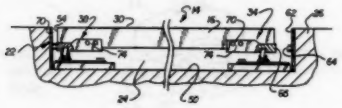
SELF-ALIGNING SCALE ASSEMBLY AND METHOD

Benny N. Dillon, 6541 Plesenton Dr., Worthington, Ohio 43085

Filed Aug. 29, 1983, Ser. No. 527,325

Int. Cl.[4] G01G *19/02, 21/24*

U.S. Cl. 177—134 **48 Claims**



1. An assembly comprising a load receiving means for receiving a load to be weighed, a plurality of force-transmitting assemblies for transmitting the load to a base, each of said force transmitting assemblies including a force measuring transducer, a slider slidable relative to said load receiving means or base, and a self-restoring force-transmitting member for vertically transmitting a force component between said slider and force measuring transducer when said slider and force measuring transducer are aligned, and means for effecting relative sliding movement between said slider and load receiving means or base to align said force measuring transducer and slider in response to sideways movement of said load receiving means.

4,554,988

METHOD AND SYSTEM FOR DISPLAYING RELATIVE VALUES ON A MULTI-SEGMENT DISPLAY

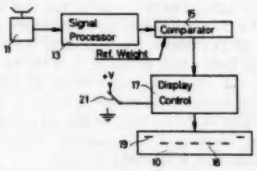
Peter Ludwig, Mönchaltorf, and Meinrad Steiner, Greifensee, both of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed Feb. 3, 1984, Ser. No. 576,550

Claims priority, application Switzerland, Mar. 3, 1983, 1158/83

Int. Cl.[4] G01G *23/30*

U.S. Cl. 177—178 **15 Claims**



1. In a measuring instrument having analog-to-digital converter means and digital processing means postcoupled to said analog-to-digital converter means for generating a signal signifying a measured value, display means comprising a display and first and second sets of elements for creating symbols signifying said measured value on said display upon selective energization by said signal, and means for temporarily deactivating said first set of elements and selectively energizing only said second set of elements to create a measurement mark at a position on said display indicative of a range of values including said measured value, the improvement comprising

reference mark supplying means connected to an input of said digital processing means for furnishing a reference mark processed by said digital processing means for positioning said reference mark relative to said measurement mark so as to indicate the value of said range of measured values relative to a reference value, and simultaneously with said reference value on said display, whereby readout from said display is so as to be readable over a large angle of view of said display.

4,554,989

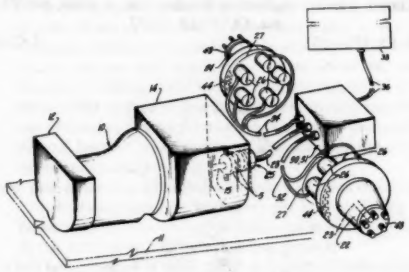
MULTIMOTOR MODULAR ELECTRIC DRIVE POWERTRAIN SYSTEM FOR TURBINE POWERED VEHICLES

Peter Gruich, 31432 Schoenherr, Apt. #5, Warren, Mich. 48093, and J. Lawrence Stopke, 4121 Buckingham St., Royal Oak, Mich. 48073

Filed Jan. 20, 1983, Ser. No. 459,439

Int. Cl.[4] B60L *11/08*

U.S. Cl. 180—65.4 **4 Claims**



1. A turbine engine powered, self-propelled vehicle driven by a multiple electric motor powertrain, the powertrain having a low speed high torque output when compared to the speed and torque characteristics of the individual motors comprising: a vehicle chassis; a vehicle drive means adapted to support and move the vehicle chassis in the desired direction, said drive means having a power drive shaft connected at one end of the drive means and adapted to provide the power to move the drive means in the desired direction and having a sun gear on the other end of the power drive shaft; a gas turbine power source mounted in said vehicle chassis; an electrical power generating set consisting of a plurality of alternator units appropriately mounted to be commonly driven by the turbine's effective output shaft, said alternators producing an alternating current; a power controller means to control the alternator output; a plurality of electrical A.C. drive motors, said drive motors being electrically connected to and driven by the power controller, each motor having an output shaft driving a planet gear engaged with the sun gear of the power drive shaft, the motors being mounted with the planetary gears equispaced about the sun gear; a plurality of speed reducers interposed between the electric motors and the motors' output shafts; and a bracket means to functionally mount the plurality of electrical motors and their respective reducer units to a mounting plate so that their respective output shafts project through the mounting plate to provide a suitable sub-assembly which may be bolt-mounted in further assembly with the drive means power-drive shaft, permitting the planet gears to engage the sun gear of the power-drive shaft.

4,554,990

ANTI-SLIP SYSTEM FOR WHEELED VEHICLE

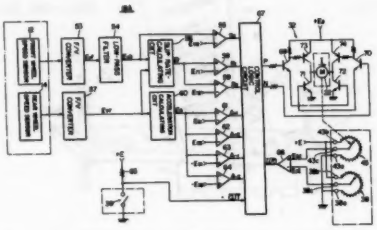
Tadashi Kamiya, Niiza, and Kiyotaka Hayashi, Urawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 540,427

Claims priority, application Japan, Oct. 12, 1982, 57-178692; Oct. 12, 1982, 57-178693

Int. Cl.[4] B60K *27/00*

U.S. Cl. 180—197 **5 Claims**



1. In a wheeled vehicle having a drive wheel, a driven wheel, a controllable throttle member, and an engine for driving said driven wheel, said engine throttling amount being responsive to at least said controllable throttle member, an anti-slip system comprising:

a drive wheel speed sensor for sensing a rotational speed of the drive wheel to produce a first sensing signal;

a driven wheel speed sensor for sensing a rotational speed of the driven wheel to produce a second sensing signal;

a throttle position sensor for sensing an operating position of said throttle member for outputting a third sensing signal;

an engine throttling sensor for sensing said engine throttling amount for outputting a fourth sensing signal;

a controller comprising a control unit responsive to said first and second sensing signals for outputting a signal representative of a slip rate of the drive wheel and further responsive to said slip rate signal and said third and fourth sensing signals for outputting a control signal; and

drive control means responsive to said control signal for controlling a drive force of the drive wheel to prevent a predetermined slip thereof.

4,554,991

AUXILIARY HYDRAULIC DRIVE SYSTEM FOR ROAD GRADERS AND THE LIKE

Brent E. Eden, Wolcott, Ind., assignor to Mud Hog Corporation, Brookston, Ind.

Filed Feb. 23, 1984, Ser. No. 582,913

Int. Cl.[4] B60K *3/00*; F16D *31/02*

U.S. Cl. 180—243 **25 Claims**

1. A hydraulic auxiliary drive system for driving the normally non-driven wheels of a vehicle, comprising

(a) at least one variable displacement motor having a tiltable swash plate operable between zero and full displacement positions, respectively, said motor driving at least one of said non-driven wheels;

(b) variable displacement pump means for supplying said motor with a constant pressure fluid;

(c) spring means normally biasing said swash plate toward its zero displacement position;

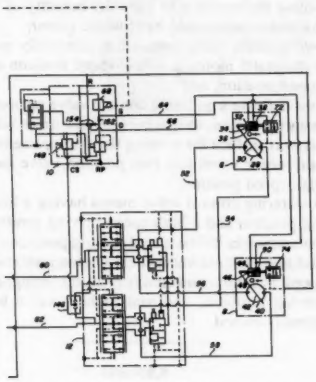
(d) servo means connected with said swash plate for tilting the same between its zero and full displacement positions, respectively;

(e) first supply means for supplying pressure fluid to said servo means to tilt said swash plate toward its full displacement position;

(f) pressure control means connected with said first supply means for controlling the pressure thereof;

(g) second supply means for supplying pressure fluid to said servo means to tilt said swash plate toward its zero displacement position;

(h) pressure responsive valve means operable when the pressure of the fluid supplied to said motor exceeds a given value to deactivate said second means, whereby said swash plate is tilted by said first supply means toward its full displacement position; and



(i) destroke limiting valve means operable by said servo means for controlling said second supply means to maintain said swash plate in a destroke position adjacent said zero displacement position, thereby to protect said motor against reaching an undesirable overspeed condition.

4,554,992

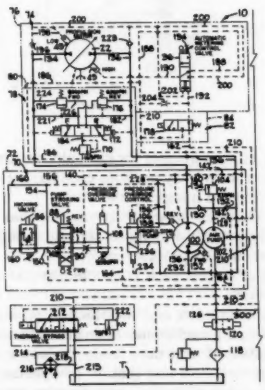
HYDRAULICALLY OPERATED FOUR WHEEL SWEEPER

Denes P. Kassai, Chino, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 9, 1983, Ser. No. 530,833

Int. Cl.[4] B60K *26/00*

U.S. Cl. 180—307 **3 Claims**



1. A hydrostatic propulsion drive system for driving a vehicle having a pair of drive wheels and at least one steerable wheel supported on a support surface, comprising:

an engine in said vehicle,

means defining a variable displacement hydrostatic motor on said vehicle and connected in driving engagement to said drive wheels,

means defining a variable displacement hydrostatic pump connected in driven engagement to said engine and in driving engagement to said motor,

means defining an adjustable inching valve,

shifting means for enabling an operator to shift said pump between a neutral position and reverse, low speed and high speed driving positions,

accelerator means connected to said inching valve for enabling the operator to vary the capacity of fluid directed by said pump to said hydrostatic motor,

a two-position valve means for selectively positioning the hydrostatic motor in a low speed position and in a high speed position, and

means defining a metering control valve responsive to variations in reaction torque between the drive wheels and said support surface for varying the displacement and speed of said motor when said two position valve means is in the high speed position,

said metering control valve means having a low speed driving position and a high speed driving position and being maintained in its low speed driving position in response to said two position valve means being positioned in its low speed position, said shifting means being in one of its driving positions, and said inching valve being at least partially closed.

4,554,993

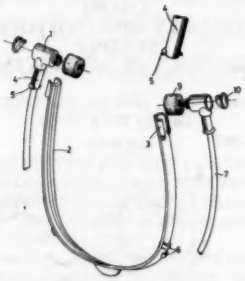
INFLIGHT HEADSET FOR CIVIL AIRCRAFT

Huang-Kiang Houng, No. 138, Chung-Hsing St., Kaohsiung City, Taiwan

Continuation-in-part of Ser. No. 544,267, Oct. 21, 1983, Pat. No. 4,472,607. This application Jul. 11, 1984, Ser. No. 629,603

Int. Cl.[4] H04M *1/05*

U.S. Cl. 181—130 **3 Claims**



1. An inflight headset for civil aircraft comprising:

a pair of main body portions each having a cylindrical member formed integrally therewith,

said cylindrical member having one end connected to said body portion and the other end being provided with a semi-circular protuberance;

a pair of covers each connected to one of said main body portions;

a headband each end of which is provided with a collar having a protuberance at one end thereof, said cylindrical member of said main body portion being fitted in said collar in such a way that the protuberance of said collar in association with the semi-circular protuberance of said cylindrical member enables said main body portion to rotate through 90° with respect to a plane perpendicular to the length of said headband;

a pair of ear cushions each connected with one of said main body portions; and

a pair of acoustic pipes each connected to one of said main body portions.

4,554,994

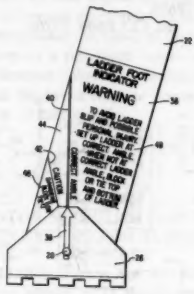
LADDER SAFETY INDICATOR

Robert I. Weiner, 305 Chesapeake Ave., Towson, Md. 21204

Filed Feb. 5, 1985, Ser. No. 698,456

Int. Cl.[4] E06C *7/00, 5/34, 5/36*

U.S. Cl. 182—18 **3 Claims**



1. A safety indicator for use with a straight or extension ladder of the type having a pair of side rails and a foot pivotally connected to each side rail at the lower end thereof and having a bottom surface for engaging the ladder supporting surface comprising:

a first indicator element adapted to be affixed to the side rail of the ladder intermediate the ends thereof and including means for indicating the angle of the principal axis of the side rail relative to the vertical; and

a second indicator element including a label adapted to be affixed to the side rail of the ladder in close proximity to the foot, said label having at least two zones defined by lines radiating from the pivotal axis of the foot, and a pointer adapted to be affixed to the foot and extending perpendicular to the bottom surface thereof, said pointer cooperating with said label to indicate the angular relation of the foot to the side rail.

4,554,995

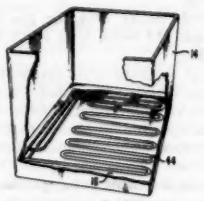
ARRANGEMENT FOR PROVIDING HEAT TO A PERSONNEL BUCKET OF AN AERIAL LIFT VEHICLE

Ronald A. Schlack, R.D. #2, Box 2266, Orwigsburg, Pa. 17961

Filed Feb. 28, 1985, Ser. No. 706,845

Int. Cl.[4] B66F *11/04*

U.S. Cl. 182—129 **7 Claims**



1. An arrangement for providing heat to a bucket associated with an aerial lift vehicle, the arrangement comprising

a tubing arrangement located at the bottom of said bucket, said tubing arrangement including an input coupler and an output coupler, said input coupler for receiving heated hydraulic fluid from an external source for circulation through said tubing arrangement, said heated hydraulic fluid circulating through said tubing arrangement thus providing a source of radiated heat to said bucket and

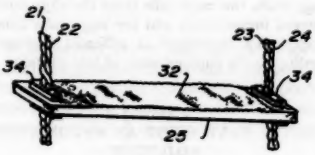
subsequently exits said tubing arrangement though said output coupler.

4,554,996

ROPE LADDER WITH MOLDED HARD ELASTOMER STEPS AND REPLACEMENT STEPS AND COLLARS THEREFOR

Robert M. Salvarezza, 110 Braemar Dr., Hillsborough, Calif. 94010

Filed Apr. 12, 1985, Ser. No. 722,859
Int. Cl.[4] E06C 1/56
U.S. Cl. 182—199 **21 Claims**



1. In a rope ladder of the type having a series of ladder steps, and two spaced-apart pairs of ropes,

a metal step frame with a pair of longitudinal members joined by a pair of shorter transverse members spaced in from the ends and strengthened by a pair of diagonal members, and having at each end a metal bracket bridging across the pair of longitudinal members and having vertical portions leading to an upper plate portion, which defines a generally rectangular opening,

a molded hard elastomer body molded around said frame and having a collar portion at each end molded around a said bracket, said body having a through opening through each collar portion and the body therebelow and in line with the openings through said brackets, each said through opening being narrow at its upper end for closely confining said pair of ropes and widening out toward its lower end each through opening tapering inwardly from bottom to top, each said step having vertical bolt openings therethrough adjacent each said through opening, and

a pair of separate wedge collars for each said step, one at each end of and below said step and bearing up against it, each said wedge collar having a through opening whose upper end is approximately the same width as said step's through opening where it emerges from its lower surface, said collar's through opening tapering inwardly therefrom down to a narrow portion at the lower end for closely confining the two ropes, each said wedge collar having vertical bolt passages therethrough aligned with the bolt openings through said step,

a generally diamond-shaped wedge heart in between the said ropes of each pair of ropes, in said through openings, said wedge heart providing two rope-engaging side grooves for locking the pair of ropes in place and preventing relative movement between them and said step, and

fastening means extending through said bolt passages and bolt openings and tightened in place to hold said wedge collar and wedge heart in place and lock said ropes in fixed position relative to said step.

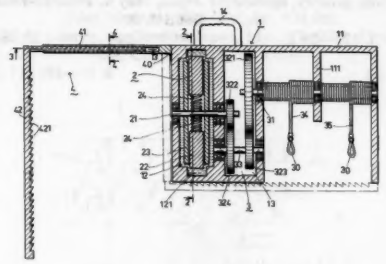
4,554,997

EMERGENCY DESCENT DEVICE

Por-Jiy Sheu, No. 111, Chien-Chen La., Chien-Chen District, Kaohsiung, Taiwan

Filed Mar. 7, 1985, Ser. No. 709,211
Int. Cl.[4] A62B 1/12, 1/16
U.S. Cl. 182—238 **4 Claims**

1. An emergency descent device comprising a rotating spool on which is wound a cable to hold a person or a load, and a rotation-retarding means for controlling the rotation of the spool, said retarding means including a fluid-filled chamber, a plurality of vane members mounted for rotation in said chamber, each of said vane members having a vane shell receiving a vane core which is normally biassed in a radially inward direction, said vane core capable of extending outward from said



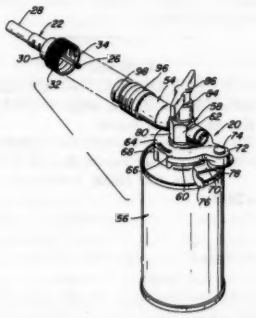
vane shell by a centrifugal force to provide more vane surface to act on the fluid, and a gear assembly which transmits the motion of said spool to said vane members with a high speed ratio.

4,554,998

SPEEDOMETER CABLE LUBRICATING DEVICE

John Kenny, 524 Horseshoe Dr., Media, Pa. 19063

Filed Sep. 19, 1984, Ser. No. 652,368
Int. Cl.[4] F16N 7/00
U.S. Cl. 184—15.1 **6 Claims**



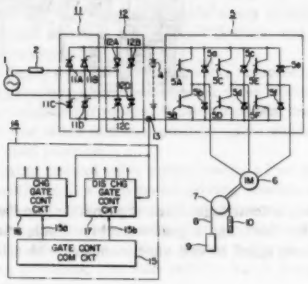
1. A device for lubricating a conventional elongated cable disposed within a tubular sheath, said sheath having a fitting at one end thereof, said apparatus comprising coupling means adapted for releasable securement to said fitting and including a cavity having an outlet in communication with the interior of said sheath when said fitting is secured to said coupling means, said fitting including an end portion adapted to be disposed within said cavity and wherein said coupling includes clip-connector means for releasably holding said end portion of said fitting within said cavity, container means having a relatively thin lubricating liquid disposed therein under gas pressure, and valve means having an outlet connected to said cavity and an inlet connected to said container, said valve means being arranged to selectively connect its inlet and outlet, whereupon said lubricating liquid is carried as an aerosol from said container into said cavity and from there through the length of said cable sheath under the pressure applied by said gas.

4,554,999

CONTROL APPARATUS FOR A.C. ELEVATOR

Hiroshi Kamaike, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 26, 1984, Ser. No. 604,010
Claims priority, application Japan, May 4, 1983, 58-78057
Int. Cl.[4] B66B *5/00*
U.S. Cl. 187—29 R **15 Claims**



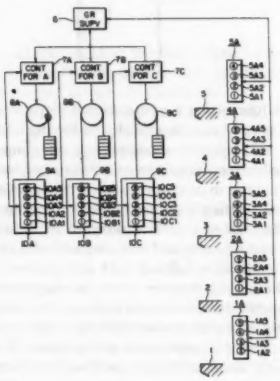
1. A control apparatus for an A.C. elevator including an A.C. power source, an induction motor, a charging device connected to the A.C. power source, batteries connected to the output of the charging device, an inverter connected to invert the output of the batteries and supply said induction motor with a variable-voltage and variable-frequency alternating current, said induction motor being connected to operate a cage, a charging rate control circuit means, and circuit means included in said control circuit means producing an output connected to control said charging device in response to changes in the load and the running direction of the cage to vary the charging rate of said batteries in correspondence with the discharging rate thereof.

4,555,000

APPARATUS FOR OPERATING AN ELEVATOR

Yasukazu Umeda, Kasugai, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 616,803
Claims priority, application Japan, Jun. 7, 1983, 58-101300
Int. Cl.[4] B66B *1/18*
U.S. Cl. 187—29 R **5 Claims**



1. An apparatus for operating a plurality of elevators for serving a plurality of floors on the basis of cage calls under group supervision comprising:

(a) a plurality of destination buttons provided in the hall of each of a plurality of floors to be operated for registering the calls in the hall and the calls for the destination from the hall;

(b) assignment means receiving signals generated by the operation of said destination buttons for assigning the calls in the hall for any one of said plurality of cages;

(c) a plurality of destination buttons provided in each of said plurality of elevators to be operated for registering destination floors for the respective cage; and

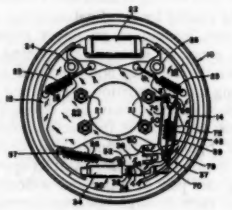
(d) registering means for registering the calls of said destination floors from both the hall buttons and the cage buttons as cage calls, the cage calls from the cage buttons being registered immediately and the cage calls from the hall buttons being registered at different registering times according to the running state of said plurality of cages.

4,555,001

OVERTRAVEL DEVICE FOR AN AUTOMATIC BRAKE ADJUSTER

James K. Roberts, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 16, 1983, Ser. No. 562,127
Int. Cl.[4] F16D *65/56*
U.S. Cl. 188—79.5 GE **9 Claims**



5. A combination spring and spring cage comprising a continuous wireform construction including a cantilever spring section constructed integrally from the wireform at one end of the cage, two normally diverging limbs of the wireform projecting from the, camtilavered spring section, said limbs terminating in complementary hook sections brought into superimposed relation when the limbs are biased together against the resistance of the integral spring section, and thereby to form an open-ended hook construction, and an elongatable spring stretched between and fastened to the open-ended hook construction and said integral cantilever spring section, respectively.

4,555,002

COMBINED SPRING MOUNT AND SECTIONED CAGE CONSTRUCTION

Peter J. Baker, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 15, 1984, Ser. No. 620,952
Int. Cl.[4] F16D *41/06*
U.S. Cl. 192—45 **3 Claims**

1. An improved cage for retaining the lock up elements of a one way clutch or the like, said cage having a connecting means to both structurally join together adjoinable parts of the cage and to mount to the cage an energizing spring biasing one of the lock up elements, said connecting means comprising;

at least two structural elements, one provided on each adjoinable cage part, and adapted to be in abutting relation to each other when the cage parts are adjoined, said structural elements when in abutting relation, being spaced a predetermined distance from said lock up elements,

and an energizing spring with a tail portion having a length sufficient to interconnect said structural elements in sufficiently tight abutting relation with each other to thereby structurally join the adjoinable cage parts together, as

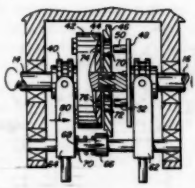
well as to thereby mount said energizing spring to the cage, said energizing spring having a bias portion extending from said tail portion substantially said predetermined distance toward said lock up element to bias said lock up element when said lock up element is retained in said cage.

4,555,003

SPLIT ENGINE CLUTCH

Howard L. Phillips, P.O. Box 392, Safford, Ariz. 85546

Filed Sep. 19, 1983, Ser. No. 533,421
Int. Cl.[4] F02B *75/32*; F16D *11/04, 23/04*
U.S. Cl. 192—53 B **11 Claims**



1. In a split crankshaft engine of the type which includes a main crankshaft section and a least one auxiliary crankshaft section, a synchronizing clutch comprising:

an input section coupled to a first end of said main crankshaft section;

a clutch plate fixedly coupled to said input section;

a first engagement plate rotatably coupled on said input section;

a second engagement plate rotatably coupled on said input section and in frictional engagement with said first engagement plate;

a pin plate fixedly coupled to an adjacent end of said at least one auxiliary crankshaft section;

a first actuation means coupled to said input section which, when placed in a first condition, disengages said first engagement plate from said second engagement plate and substantially reduces the speed of said second engagement plate, and when placed in a second condition, causes said first engagement plate to engage said second engagement plate causing said second engagement plate to rotate producing a relative angular velocity between said first and second engagement plates; and

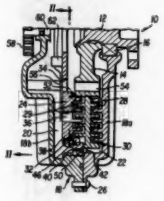
second actuation means coupled to said pin plate which, when placed in a first condition disengages said pin plate from said first and second engagement plates so as to disengage said main crankshaft section and said auxiliary crankshaft section, when placed in a second condition, causes said pin plate to engage said second engagement plate, and when placed in a third condition, causes said pin plate to engage said first engagement plate to couple, in phase, said main and auxiliary crankshaft sections.

4,555,004

TEMPERATURE RESPONSIVE FLUID COUPLING DEVICE

Ryuji Nakamura, Okazaki, and Masaharu Hayashi, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 14, 1983, Ser. No. 474,962
Claims priority, application Japan, Mar. 17, 1982, 57-40756
Int. Cl.[4] F16D *35/00, 43/25*
U.S. Cl. 192—58 B **8 Claims**



1. A temperature responsive fluid coupling device, comprising:

a power input coupling member having a rotatable rotor mounted thereon;

a power output coupling member for rotating relative to said power input member;

a dividing plate dividing an interior portion of said power output coupling member into a reservoir chamber for a viscous fluid and a working space accommodating said rotatable rotor;

a first operating chamber formed between said rotatable rotor and said power output coupling member;

a second operating chamber formed between said rotatable rotor and said dividing plate;

said dividing plate having first and second fluid return openings formed therein so as to supply said viscous fluid from said reservoir chamber to said first and second operating chambers;

a first pumping mechanism located in said first operating chamber for discharging said viscous fluid from said first operating chamber;

a second pumping mechanism located in said second operating chamber for discharging said viscous fluid from said second operating chamber into said reservoir chamber independent of said first pumping mechanism;

a temperature responsive member operatively associated with said power output coupling member;

a valve plate connected to said temperature responsive member and which is slidingly and rotatably mounted on said dividing plate via said temperature responsive member for selectively opening and closing only said first and second fluid return openings thereby controlling the amount of viscous fluid transferred from said reservoir chamber to said first and second operating chambers in response to changes of ambient temperature of said power output coupling member and independent of operation of said first and second pumping mechanisms;

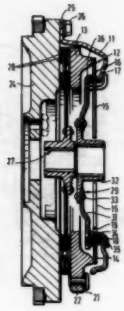
said dividing plate and said rotatable rotor having a clearance formed therebetween so as to prevent said first and second pumping mechanisms from interfering with each other in operation; and

a partition wall, formed as a unitary part of said dividing plate, for preventing said viscous fluid from being transferred from said first operating chamber to said second operating chamber.

4,555,005
FRICTION CLUTCHES

Alan G. Dixon, Wellesbourne, England, assignor to Automotive Products plc, Leamington Spa, England

Filed Jan. 18, 1984, Ser. No. 571,725
Claims priority, application United Kingdom, Jan. 19, 1983, 8301425
Int. Cl.⁴ F16D *13/50*
U.S. Cl. 192—70.27 **5 Claims**

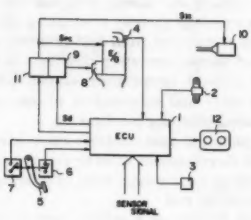


1. A friction clutch comprising a cover member, a pressure plate, mounting means mounting the pressure plate with respect to the cover member for axial movement relative thereto, a diaphragm spring having an outer annular belville portion, inwardly directed fingers and mounting apertures defined between adjacent fingers at roots thereof, the diaphragm spring being disposed between the cover member and the pressure plate so as to urge the pressure plate in a direction away from the cover member towards and into frictional engagement with a driven plate to provide a primary drive from the clutch through the driven plate, tabs for locating the diaphragm spring with respect to the cover member, said tabs passing through said mounting apertures and having portions thereof bent over to hold the diaphragm spring in position, and a secondary drive member for a secondary drive from the clutch incorporating further tabs engaged in said mounting apertures and having portions bent over to locate said secondary drive member with respect to the cover.

4,555,006
AUTOMATIC ENGINE STOP AND START SYSTEM

Shigekatsu Uchida; Takao Akatsuka, and Takahide Kawamura, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 23, 1982, Ser. No. 360,973
Claims priority, application Japan, Jul. 28, 1981, 56-117999
Int. Cl.⁴ B60K *41/02*
U.S. Cl. 192—0.084 **3 Claims**



1. A system for automatically stopping and restarting a motor vehicle engine having, a starter with a starter relay and a clutch pedal operatively associated therewith, in response to predetermined conditions comprising:

detecting means coupled to said motor vehicle for detecting various conditions of said motor vehicle;

control means coupled to said detecting means for judging whether or not predetermined conditions for automatic starter energization are fulfilled to generate a drive signal wherein said predetermined conditions include at least a full and a slight depression of said clutch pedal;

first connecting means coupled to said control means for outputting said driving signal to said starter relay when said predetermined conditions are met;

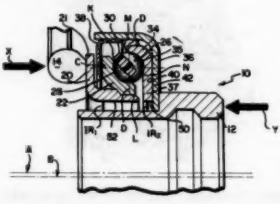
clutch switch disposed between said first connecting means and said starter relay, mechanically connected with said clutch pedal and closed in response to the full depression of said clutch pedal; and

second connecting means coupled to said switch means for energizing said starter relay.

4,555,007
SELF ADJUSTING THRUST, LOW ANGULAR CONTACT BEARING

Richard F. Harrington, Lincolnwood; Richard T. Dagiel, Elk Grove Village, and Villy Brown, Chicago, all of Ill., assignors to Aetna Bearing Company, Chicago, Ill.

Filed Dec. 15, 1983, Ser. No. 561,642
Int. Cl.⁴ F16D *19/00*
U.S. Cl. 192—98 **8 Claims**



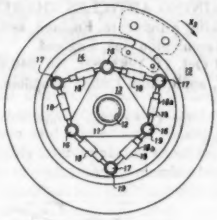
1. A clutch release bearing assembly for use in combination with a carrier sleeve, which carrier sleeve defines a first axis, said bearing assembly adapted to be brought into engagement with the rotating clutch fingers, or the like of a clutch mechanism, which clutch fingers are rotating about a second axis which may not be coincidental with said first axis, the rotational components of said bearing assembly being adapted to adjust their rotational orientation to coincide with the second axis of rotation of said clutch fingers, said bearing assembly comprising; an annular thrust face member for engaging said clutch fingers, an annular cone raceway member affixed to the thrust face member, an annular cup raceway member rotatable relative to the cone raceway member, a plurality of bearing elements disposed between the raceway members, an annular shell housing member adjacent the cup raceway member and adapted to be mounted to a cylindrical carrier sleeve in surrounding relation to said raceway members, said cup raceway member having an outer diameter less than the inner diameter of the shell housing member, and said thrust face member and said cup raceway member each having an inner diameter greater than the outer diameter of carrier sleeve to which the bearing assembly is mounted, and the cup raceway member and shell housing member being movable relative to one another, such that the thrust face member, the cone raceway member and the cup raceway member are free to float in a radial direction and thereby adjust their respective positions to the axis of rotation of the clutch fingers which will engage said thrust face member.

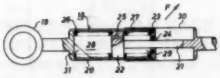
4,555,008

DAMPER DISC SUITABLE FOR AUTOMOBILE CLUTCH

Tamio Nagano, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Jun. 27, 1983, Ser. No. 508,094
Claims priority, application Japan, Jun. 29, 1982, 57-113656
Int. Cl.⁴ F16D *3/14*
U.S. Cl. 192—106.1 **3 Claims**





1. A hydraulically dampened clutch plate having a central hub with a spline on its inner peripheral surface and an integral flange extending radially therefrom, said radial flange having a plurality of pins equally spaced radially from said hub and equally spaced circumferentially around said hub and extending parallel to the axis of said hub, a friction disc plate extending radially outwardly of said hub, parallel to said hub flange, and rotatably supported on the outer peripheral surface of said hub, said friction disc plate having mounted on at least one of its faces, outwardly of said radial hub flange and said hub flange pins, a friction facing, a plurality of friction disc plate pins equally spaced on said disc radially from said hub and equally spaced circumferentially around said hub on said friction disc plate, said friction disc plate pins being each spaced equidistant from the adjacent pair of radial flange pins when such clutch plate is at rest and a plurality of shock absorbers interconnecting each of said friction disc plate pins with the adjoining each of said pair of flange pins, each of said shock absorbers including a fluid tight cylinder pivotally connected to one of an adjoining disc plate pin and flange pin, a piston rod pivotally connected to the other of said adjoining disc plate pins and flange pin, a piston on said piston rod and slidable in said fluid tight cylinder and forming chambers in said cylinder at the opposite sides of said piston, a port through said piston interconnecting said chambers in said cylinder at the opposite sides of said piston, a compression spring in each of said chambers for compression between the piston face and the end wall of said cylinder as said piston is moved therein and a hydraulic fluid sealed in said cylinder for flow through said piston in a first direction when said hub flange pins and said friction plate pins are rotated about said hub toward each other and for flow in the opposite direction when said hub flange pins and said friction plate pins are rotated away from each other.

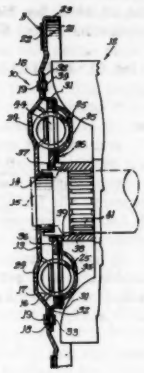
4,555,009

MINIMUM COMPLEXITY VIBRATION DAMPER

Paul A. Habel, and Elaine S. Kulczycki, both of Troy, Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 22, 1983, Ser. No. 564,151
Int. Cl.⁴ F16D *3/14*
U.S. Cl. 192—106.2 **7 Claims**

1. A vibration damper assembly for a torque converter lock-up clutch, friction clutch or torsional coupling, comprising a pressure plate, a generally cylindrical hub barrel operatively connected to a transmission input shaft, a hub plate operatively connected to the hub barrel and having a pair of diametrically oppositely disposed spring windows, and a pair of oppositely disposed damper springs received in said window, said pressure plate and hub plate forming spring pockets enclosing said damper springs and providing reaction surfaces contacting the ends of the springs.

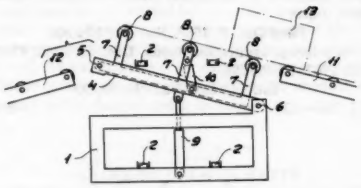


4,555,010

JUNCTION DIVERTER FOR A TRANSPORT SYSTEM

Jorgen Solund, Haslev, Denmark, assignor to ITS-Intern Transport System A/S, Haslev, Denmark

PCT No. PCT/DK83/00044, § 371 Date Dec. 13, 1983, § 102(e) Date Dec. 13, 1983, PCT Pub. No. WO83/03592, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 15, 1983, Ser. No. 566,137
Claims priority, application Denmark, Apr. 16, 1982, 1707/82
Int. Cl.⁴ B65G *47/57*
U.S. Cl. 198—361 **8 Claims**



1. A junction diverter for a transport system having a main conveyor path (2) extending through or terminating at the junction, and a pair of lateral conveyor paths (11,12) extending obliquely downwards from the junction at their respective sides of the main conveyor path (2), the junction diverter comprising means (8) providing a movable supporting surface which, in an inoperative position, is disposed below the main conveyor path (2), and in an operative position, is lifted above the main conveyor path (2) to an inclined position in which it is flush with one or the other of the lateral conveyor path (11,12), characterized in that said means (8) providing a movable supporting surface are secured to and extend upwardly from a first carrier frame (3), which is journalled on a second carrier frame (4) for pivotal movement about a first axis (5) disposed substantially in parallel with the main conveyor path (2) and at one side of the center thereof, and that said second carrier frame (4) is journalled on a frame (1) for the main conveyor path (2) for pivotal movement about a second axis (6) disposed substantially in parallel with the main conveyor path (2) and at the other side of the center thereof.

4,555,011

CONVEYING ROD-LIKE ARTICLES

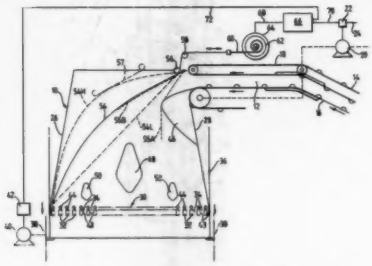
Anthony R. Brown, Milton Keynes, England, assignor to Molins PLC, London, England

Filed Jul. 26, 1983, Ser. No. 517,408

Claims priority, application United Kingdom, Jul. 29, 1982, 8221951

Int. Cl.[4] B65G *43/00*

U.S. Cl. 198—444 26 Claims



22. A conveyor system for rod-like articles, comprising at least one conveyor for moving articles in stack formation to or from a transition zone, a flexible membrane at least partly confining the articles at the transition zone, means for extending and retracting the membrane under tension in response to pressure of articles in the transition zone, detector means responsive to the longitudinal position of the membrane, and means for controlling said conveyor in response to signals from the detector means.

4,555,012

METHOD AND DEVICE FOR SEPARATING AND CONNECTING TRANSFER BAR OF THREE UPRIGHT TYPE TRANSFER PRESS

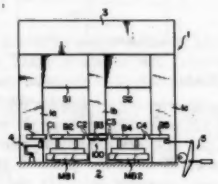
Kiyokazu Baba, Komatsu, and Kenji Nishida, Matsuto, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,553

Claims priority, application Japan, Dec. 10, 1982, 57-215542; Dec. 10, 1982, 57-185956

Int. Cl.[4] B65G *25/00, 37/00*

U.S. Cl. 198—621 3 Claims



2. A device for separating a transfer bar of a three-upright type transfer press having first and second movable bolsters and a set of transfer bars each capable of being separated into five bar pieces, that is, an inlet side bar piece, first and second central bar pieces respectively positioned above said first and second movable bolsters, an intermediate bar piece positioned between the central bar pieces and an outlet bar piece, characterized by comprising a locking mechanism for temporarily locking said intermediate bar piece to a central upright of the transfer press body; a support means for supporting said first and second central bar pieces respectively on said first and second movable bolsters so that the first and second bar pieces are respectively movable a predetermined distance longitudinally outwards thereof; a first separating means for separating said first and second central bar pieces from said intermediate bar piece positioned therebetween; and a second separating means for separating said inlet and outlet side bar pieces respectively from said first and second central bar pieces, said second separating means being adapted to operate in synchronism with said first separating means.

4,555,013

CONVEYOR BELT HAVING VACUUM SYSTEM FOR RETAINING ARTICLES THEREON

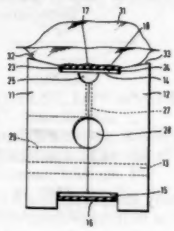
Kenneth W. Franklin, Knightcote, England, assignor to Bishopbarn Limited, Leamington Spa, England

Filed Oct. 11, 1983, Ser. No. 540,409

Claims priority, application United Kingdom, Oct. 28, 1982, 8230777

Int. Cl.[4] D65G *17/46*

U.S. Cl. 198—689.1 5 Claims



1. A conveyor comprising an endless belt, means mounting the belt for travel of the belt in an endless path including an upper generally horizontally extending reach in which the belt travels in a forward direction for conveying forward items on the belt, and means for drawing a vacuum along said reach for vacuum gripping the items to the belt to avoid shifting of the items relative to the belt, said belt having transverse teeth on its underside, the belt mounting means has a groove through which said reach of the belt travels, the groove being wider than the belt and the belt travelling through the groove with gaps between its side edges and the sides of the groove, and said vacuum means comprising means for drawing a vacuum in the groove to draw a vacuum through the gaps via the spaces between the teeth of the belt for vacuum gripping the items to the upper face of said reach of the belt.

4,555,014

CONVEYOR CHAIN LINK STRUCTURE

James F. Krempa, Milford, Mich., assignor to Chain Supply Company, Detroit, Mich.

Continuation of Ser. No. 404,632, Aug. 2, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 680,749

Int. Cl.[4] B65G *17/38*

U.S. Cl. 198—852 10 Claims

1. A conveyor drive and guide chain comprising a plurality of consecutive socket links and trunnion links, each of said socket and trunnion links comprising a pair of half-links interconnected at a pivotal connection about a first pivot axis, said half-links being bifurcated at an end and the bifurcated end of one of said half-links being disposed within the bifurcated end of the other at said pivotal connection, a guide roller mounted at said pivotal connection about said first pivot axis for rolling engagement with one or the other of a pair of parallely dis-

posed guide rails, a cylindrical socket at each end of said socket links and a cylindrical trunnion member at each end of said trunnion links for pivotal connection of each socket link to an adjacent trunnion link about a second pivot axis substantially at a right angle to said first pivot axis, said cylindrical socket comprising a first socket member integrally formed at each end of said socket links and having a partially circular cylindrical recess, a separate second socket member attachable to said first socket member, said second socket member having a segment circular recess portion forming with said partially circular cylindrical recess of said first socket member a cylindrical concave surface extending over an arc of more than about 180°, each said cylindrical trunnion member being integrally formed at each end of said trunnion links and having a peripheral cylindrical convex surface extending over more than about 180° in engagement with said socket cylindrical concave surface, wherein said consecutive socket links and trunnion links are pivotably interconnected about said second pivot axis by engagement of each trunnion member between said first and second socket members and attaching said second socket member to said first socket member.

4,555,015

ANIMAL REPELLENT BAG PACKAGE AND METHOD OF PREPARING THE SAME

Donald A. Haase, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,763
Int. Cl.⁴ B65D *85/84*
U.S. Cl. 206—0.5 **3 Claims**

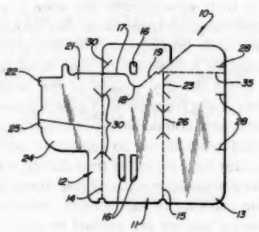
1. Package containing a plurality of folded bags, comprising a sealed package containing therein a plurality of folded bags, each of said bags having, over comparatively broad surfaces of both the inside and outside thereof, an effective proportion of an animal repellent comprising methyl nonyl ketone which emanates from a comparatively small area of at least one surface of said bag, said small area containing an unconfined amount of said repellent which is applied thereto prior to introduction of said bag into said package to permit said emanation, said emanation occurring during the time said bag is folded and within said sealed package, said sealed package having walls defining said package which are impervious to said repellent.

4,555,016

THREE-PANEL NEEDLED SUTURE HOLDER

Jorge L. Aday, Lambertville, and Robert J. Cerwin, Pittstown, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 14, 1985, Ser. No. 744,856
Int. Cl.⁴ A61L *17/02*
U.S. Cl. 206—63.3 **7 Claims**



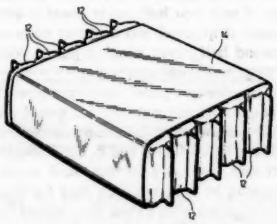
1. An improved retainer for needled surgical sutures comprising:
(a) a center panel;
(b) a pair of side panels;
(c) said center panel being substantially rectangular in shape;
(d) a side panel foldably connected to each of the longitudinal edges of the center panel;
(e) at least one upper aperture located adjacent one transverse edge of said center panel through which a pin may protrude on which the suture may be wound;
(f) at least one lower aperture located adjacent the opposite transverse edge of said center panel through which a pin may protrude on which the suture may be wound;
(g) one of said side panels being configured so that when it is folded upon the center panel it is substantially coextensive with the center panel in the central portion thereof but does not cover the apertures;
(h) said side panel being sectioned transversely so that the needle of the needle surgical suture may be placed on the center panel adjacent the upper aperture and the first section of said side panel folded over on to the center panel to cover and enclose a portion of the needle without covering the entire needle or said upper aperture, whereby when the suture is wound about the pins protruding from the apertures the initial winding of the suture will hold the needle in place while the suture is being wound about the pins;
(i) the second section of said side panel being foldable over the center panel to contain the lower portion of the wound sutures;
(j) the other side panel being substantially coextensive with the center panel and foldable about the longitudinal edge thereof connecting said side panel to the center panel;
(k) said center panel including at least one slit extending from a longitudinal edge of said panel towards the center of said panel, said slit being positioned below but in close proximity to said upper aperture;
(l) a scored line extending from the end of said slit towards the opposite longitudinal edge of said center panel, whereby a portion of said center panel can be folded back to expose a needled surgical suture within the retainer;
(m) said other side panel having a fold line extending across the width of the panel, said fold line being spaced from a transverse edge of said panel so as to be adjacent said upper apertures when the panels are folded together, whereby when the portion of the center panel is folded back to expose the needled suture a portion of the side panel may also be folded back to fully expose the needled suture and allow for adjustable accessing of the needled suture in an appropriate needle holding instrument; and
(n) said folder including locking means to maintain the folded panels in place and maintain the needled surgical suture in the desired configuration.

4,555,017

BALES OF BAGGED BATTS

Phillip W. Blackmore, Camlachie, Canada, assignor to Fiberglas Canada Inc., Toronto, Canada

Continuation-in-part of Ser. No. 555,846, Nov. 28, 1983. This application Dec. 3, 1984, Ser. No. 677,261
Claims priority, application Canada, Sep. 14, 1983, 436628
Int. Cl.⁴ B65D *85/16, 85/62, 71/06*
U.S. Cl. 206—83.5 **4 Claims**



1. A bale comprising elongated flexible bags of generally

rectangular section, each containing one or more batts of fibrous heat insulating material, each bag retaining the fibrous heat insulating material therein in a low compressed state, the bags being aligned in a row with larger faces in mutual contact, and a sleeve of flexible relatively non-extensible wrapping material having a width which is a substantial proportion of the length of the batts, the wrapping sleeve extending around the row of bags and compressing the bags to retain the fibrous heat insulating material in a further compressed state in which the volume of the fibrous heat insulating material is further reduced but which is insufficient to prevent substantially full recovery of the fibrous heat insulating material to its uncompressed volume when the fibrous heat insulating material is removed from the bags after the wrapping sleeve has been removed.

4,555,018

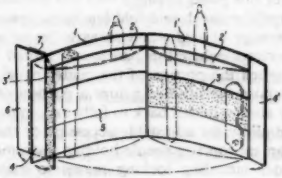
PORTABLE FOLDER TYPE PENCIL CASE

Hyon M. Cho, Room No. 1002, 105-dong, Woosung Apartment 239-1, Banpo-dong, Kangnam-ku, Seoul, Rep. of Korea

Filed Jan. 27, 1984, Ser. No. 574,516

Int. Cl.[4] B65D *85/28*

U.S. Cl. 206—214 **1 Claim**



1. A portable folder type case for holding writing utensils or the like, comprising:

a cover sheet panel being foldable in half and including first and second half panels each respectively having an inner half panel overlaid and joined at opposite ends thereof on a front face of said cover panel so as to form a first and second pocket for said utensils, said first inner half panel having a non-adhesive lateral mid-portion and said second inner half panel having an adhesive lateral mid-portion for supporting said writing utensils;

a first and second guard strip panel wherein an outer end portion of said first half cover panel is joined with said first guard strip panel and an outer edge end portion of said second half cover panel is joined with said second guard strip panel; and

a single-face adhesive panel strip connected to said cover sheet panel adjacent said second guard panel strip and including a panel strip for reinforcement of said single-face adhesive panel strip and being foldable backward to support said case on a surface, said second guard strip panel having an adhesive back face for being selectively securely engaged with a front face of said first guard strip panel wherein said second guard strip panel is foldable along fold lines away from said single face adhesive panel strip and toward said first guard strip panel.

4,555,019

PACKAGED DETERGENT COMPOSITION WITH INSTRUCTIONS FOR USE IN A LAUNDERING PROCESS

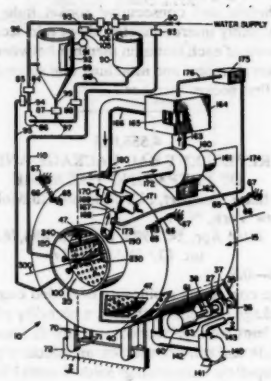
Wolfgang U. Spendel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 548,265, Nov. 3, 1983, Pat. No. 4,489,455, which is a continuation-in-part of Ser. No. 436,169, Oct. 28, 1982, Pat. No. 4,489,574, which is a continuation-in-part of Ser. No. 320,155, Nov. 10, 1981, abandoned. This application Jun. 22, 1984, Ser. No. 623,809

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.[4] B65D *85/00*

U.S. Cl. 206—223 **1 Claim**



1. A granular, paste, gel or liquid detergent composition packaged in association with instructions for use in a process for laundering a discrete wash load of assorted soiled textiles, the instructions comprising:

(a) produce a quantity of concentrated aqueous wash liquor comprising from about 40% to about 99.9% water and from about 1000 ppm to about 600,000 ppm of the packaged detergent composition;

(b) distribute substantially evenly and completely onto said textiles in their substantially dry state a quantity of said wash liquor ranging from about just enough to distribute said wash liquor substantially evenly and completely onto said textiles to a quantity of said wash liquor which is about 5 times the dry weight of the textiles, said wash liquor containing from about 5 grams to about 200 grams of said detergent composition per kilogram of said textiles;

(c) allow said wash liquor to remain in contact with said soiled textiles for a period of time during which, if there is more than a minimal amount of free liquor in excess of the absorption capacity of said textiles, only limited amounts of mechanical energy are applied to said textiles so as to prevent oversudsing;

(d) rinse said textiles with a quantity of an aqueous liquid, rinse liquor sufficient to produce enough free water on the surface of said textiles to adequately suspend the soil and the detergent composition; and

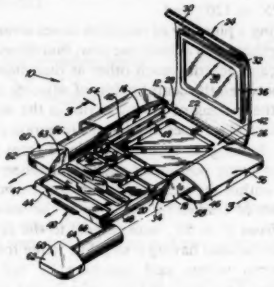
(e) separate said rinse liquor containing said wash liquor and said soil from said textiles.

4,555,020

COMPACT

Ugo Campello; Enrico Racca, both of Miami, Fla.; Pierluigi Sosta, and Deris Baggiolini, both of Concesio, Italy, assignors to New High Glass, Miami, Fla.

Filed Aug. 23, 1984, Ser. No. 643,819
Int. Cl.[4] A47B 67/00
U.S. Cl. 206—235 11 Claims



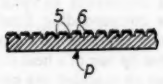
1. A multicompartment compact comprising:
a center compartment including a base wall and spaced apart upstanding side walls connected to and extending from said base wall;
a bottom tray removably mounted in said center compartment;
a top tray slideably mounted to said bottom tray such that in a first position said top tray covers said bottom tray and such that in a second position said top tray enables access to said bottom tray, said top and bottom trays including means for preventing separation of said top tray from said bottom tray;
a top hingedly connected to and adapted to enclose said center compartment;
a pair of side housings connected respectively to the side walls of said center compartment, each said side housing defining an enclosure having at least one opened end;
and at least one side compartment frictionally retained in each said side housing, each said side compartment including a handle portion and a container portion attached to said handle portion, said container portion being slidably disposed in the respective side housing, said handle portion of each said side compartment including a wall engaging the respective side wall of the center compartment and preventing rotation of said handle relative to said side wall when said side compartment is in one of said side housings.

4,555,021

CASING FOR MAGNETIC TAPE CASSETTE

Tatsuo Fujii, and Shigetomo Takeda, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,187
Claims priority, application Japan, Jun. 1, 1983, 58-81837[U]
Int. Cl.[4] B65D 55/02, 85/67
U.S. Cl. 206—387 4 Claims



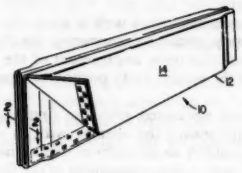
1. A casing for holding a magnetic tape cassette which is formed into a box shape by bending and joining a blank of a transparent plastic plate material which has one surface, constituting the inner surface of a casing, on which grooves and a minutely roughened area are provided except for on a predetermined portion including at least one transparent window and the other surface, constituting the outer surface of said casing, on which printing and/or an uneven surface pattern is provided in a predetermined portion except for said transparent window.

4,555,022

PEEL PACKAGE STERILE SANITARY PADS

Vicki L. Eagon, 5762 Haney Dr., Watauga, Tex. 76148, and Towanda S. Showers, High Meadow Dr., Lt. 40, Fort Worth, Tex.

Filed Feb. 6, 1984, Ser. No. 577,375
Int. Cl.[4] B65B 83/00; B65D 75/00
U.S. Cl. 206—440 2 Claims



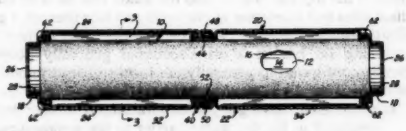
1. A sanitary pad package comprising:
a sterilizable, single layer backing sheet;
a dry sterilizable absorbent sanitary pad secured on a first side of the backing sheet, the backing sheet extending beyond the edges of the sanitary pad, the backing sheet and sterilizable absorbent sanitary pad being sterilizable for use of the sanitary pad package within a sterile field;
a continuous strip of peelable adhesive secured on the first side of the backing sheet and extending about the periphery of the sanitary pad so that the backing sheet can be folded to bring portions of the strip of peelable adhesive into facing relationship to form a continuous seal about the periphery of the sanitary pad to enclose the sanitary pad in the backing sheet so that the sterility of the sanitary pad can be maintained prior to enduring opening of the sanitary pad package, the peelable adhesive eliminating the need to tear the backing sheet to open the sanitary pad package, thereby reducing the time and effort needed to open the sanitary pad package while maintaining the sterility of the sterilizable absorbent sanitary pad; and
strips of peelable adhesive secured on the opposite side of the backing sheet and the backing sheet is folded along intermediate fold lines outward from the continuous seal to form a compact package.

4,555,023

DRUM CONTAINERS

Donald J. Sykes, Upper Saddle River, N.J., and Gary E. Gendron, Boiceville, N.Y., assignors to Marpac Industries, Inc., Waldwick, N.J.

Filed May 14, 1985, Ser. No. 734,082
Int. Cl.[4] B65D 85/20, 85/30, 81/02
U.S. Cl. 206—446 10 Claims



1. A container for containing a drum, the drum having a longitudinally-extending sensitive cylindrical outer surface and opposite end journals, the container comprising:
a longitudinally-extending, relatively thin-walled container body having opposite end walls and a plurality of essen-

tially flat side walls extending longitudinally between the end walls to define a container interior, with adjacent side walls intersecting one another to establish reinforcing corners and a polygonal cross-sectional configuration having apexes located at the reinforcing corners;

support means in the end walls for supporting the end journals of the drum so as to support the drum in a suspended position within the interior of the container body with the cylindrical outer surface of the drum spaced from the side walls of the container body;

the container body including an opening for admitting the drum into the container, and at least a first body portion and a second body portion, the first body portion being selectively engageable with the second body portion for closing the opening to contain the drum within the container body;

securing means associated with at least one of the first and second body portions for securing the drum in said suspended position upon engagement of the first body portion with the second body portion to close said opening; and

sealing means associated with the first and second body portions for sealing the opening with an air-resistant seal so as to establish an air cushion within the interior of the container body upon engagement of the first body portion with the second body portion to close said opening;

said air cushion and said reinforcing corners being effective to maintain the spacing between the cylindrical outer surface of the drum and the side walls of the container body so as to preclude damaging contact between the side walls of the container and the sensitive cylindrical outer surface of the drum.

4,555,024

PACKAGING UNIT FOR SEMICONDUCTOR WAFERS

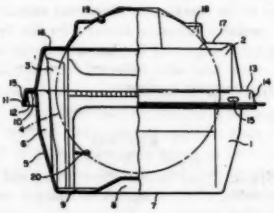
Jürgen Voss, Burghausen; Otto Dombkowski, Kirchdorf; Walter Kudlich, Burghausen, and Jan Stodulka, Tittmoning, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,405

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413837

Int. Cl.[4] B65D *85/30, 57/00, 81/00*

U.S. Cl. 206—454 **7 Claims**



1. In a packaging unit for semiconductor wafers of the type including a wafer carrier for receiving the wafers which is open at the top and bottom and has guide ribs on both longitudinal sides and a crossbar at one open end face thereof, a generally tub-shaped container for receiving the wafer carrier, and a matching lid having a cross-sectional generally polygonal profile configured to generally conform to the circumference of the wafers, the improvement comprising:

said container having a plurality of lateral surface portions arranged to fix the wafer carrier in the longitudinal and transverse directions with predetermined close tolerances;

snap lock means for connecting said container and said matching lid to each other;

said wafer carrier having a plurality of spring tongues arranged on both longitudinal sides thereof such that they are each disposed between a pair of adjacent guide ribs on the same level corresponding to about one fifth to one third of the lateral height of said carrier, said tongues having a free end extending downwardly into the interior of the wafer carrier at an angle deviating from 0° to 30° from the horizontal, with the length of said tongues being selected such that, upon loading of a wafer, the points of support of a wafer on said tongues and the center point of the wafer enclose an angle of from 75° to 120°; and

said lid having a plurality of retention cones arranged on the inner side thereof in at least one row, said cones projecting inwardly and abutting each other at their bases with the spacing between the center points of adjacent cones being equal to the spacing of the guide ribs in the wafer carrier and the conical surfaces of adjacent retention cones cooperatively defining an included angle of from 60° to 90°, said cones being positioned such that, when a wafer is received within the packaging unit and the lid is closed, their points of contact on the edge of the wafer form an angle of from 0° to 50°, with respect to the center of the wafer, said lid also having a step-like ledge for fixing the wafer carrier within said matching lid and container which aligns a top edge of said wafer carrier with said lid such that corresponding and oppositely-disposed guide ribs and retention cones are arranged in one plane, whereby when the wafers are received within the packaging unit and the lid is closed, the wafers come into contact only with the conical surfaces of adjacent holding cones and the free end of the spring tongues.

4,555,025

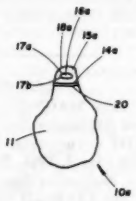
SHRINK BAG WITH INTEGRAL HANDLE

Alan S. Weinberg, Greenville; B. Gary Wofford, Spartanburg, both of S.C., and Philip T. Voso, Tryon, N.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 510,108, Jul. 1, 1983, abandoned. This application Mar. 13, 1985, Ser. No. 733,405

Int. Cl.[4] B65D *30/02, 33/02, 33/08*

U.S. Cl. 206—497 **10 Claims**



1. A shrink bag comprising an integral carrying handle, a rear bag panel, a corresponding front bag panel which is shorter than the rear bag panel, the front and rear bag panel forming an extended lip bag of a heat shrinkable thermoplastic material and having an unsealed bag mouth at one end of said bag and a carrying hole in said lip with a continuous fused bead around the periphery of said hole, said carrying hole being spaced sufficiently below a top of said lip such that upon heat shrinking said bag about a product sealed therein enhanced thickening along a load-bearing portion of said hole periphery occurs relative to a non load-bearing portion of said hole periphery.

4,555,026

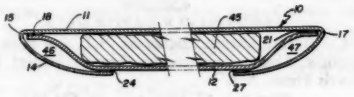
ENVELOPE

Edward G. Hewitt, Auburn, and William D. Pasquale, Northboro, both of Mass., assignors to New England Mfg. Co., Worcester, Mass.

Continuation-in-part of Ser. No. 613,457, May 24, 1984. This application Apr. 26, 1985, Ser. No. 727,818

Int. Cl.[4] B65D *27/00, 85/30*

U.S. Cl. 206—521 **4 Claims**



1. Envelope, comprising:

(a) a rectangular front panel,

(b) a rectangular rear panel attached to the front panel along a bottom edge fold line,

(c) an end flap attached to each of two opposed end edges of the front panel,

(d) a narrow gum strip located on the inner surface of the rear panel adjacent each of two opposed end edges to permit attachment to the inner surface of the front panel adjacent its said end edges, and

(e) a narrow gum strip located on the inner surface of each end flap adjacent an end edge to permit attachment of each end flap to the outer surface of the rear panel at a position spaced inwardly a substantial distance from the said end edges of the rear panel, wherein a bulky package inserted centrally between the front and rear panels separates a central portion of the rear panel from the front panel, while the narrow gum strip located on the inner surface of the rear panel adjacent the end edge maintains the adjacent portion of the rear panel against the front panel, so that the rear panel buckles into an ogee shape due to the stiffness of the material from which the panel is formed, thus forming a cylindrical cell at each end extending parallel to the end edge and lying between the two adjacent gum strips.

4,555,027

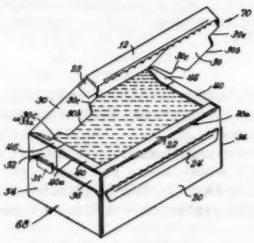
CARTON FOR PACKAGING ICE CREAM OR LIKE FROZEN, INITIALLY LIQUID OR SEMI-SOLID MATERIAL

Thomas W. Froom, 10 Burncoat Way, Pittsford, N.Y. 14534

Filed Sep. 19, 1983, Ser. No. 533,454

Int. Cl.[4] B65D *5/54*

U.S. Cl. 206—626 **14 Claims**



1. In a filled package comprising a completely closed, rectangular carton made from a single unitary sheet of carton stock having cut portions and fold lines defining a front panel, a bottom panel, a rear panel, a cover panel, and a front cover flap which are articulated one to the other in the order named; said front cover flap having a skirt portion overlying said front panel but not adhered thereto and a sealing portion sealed to said front panel to form said panels into a carton having a rectangular transverse cross section; said front and rear panels having front and rear inner end-wall-forming flaps articulated thereto by fold lines and being folded in, to form inner end walls, and said bottom panel having outer end wall-forming flaps articulated to the sides thereof by fold lines and bent up to a position to overlie the inner end-wall-forming flaps; said cover panel having side cover flaps articulated to the side edges thereof by fold lines and folded down to overlie said end walls; said front cover flap skirt portion having glue-tabs articulated to the side edges thereof by fold lines, which tabs are glued to said side cover flaps to form, with said cover panel, a skirted cover hinged to said rear panel;

the improvement in which

said end walls have inturned end lips which are articulated thereto by lip-flap fold lines and which underlie and contact the underside of the cover panel at least along the free edge of each lip, but without being adhered thereto and,

the front panel has a front lip which is articulated thereto by a panel-lip fold line and is in a position such that it underlies the underside of the cover panel and contacts the same at least along its free edge, but without being adhered thereto;

said lips having complementary shaped adjacent ends and being of such width that the inner edges of the end lips meet the inner edge of the front lip in right angle corners and provide a U-shaped line of contact between the edges of said lips and the under surface of said cover panel.

4,555,028

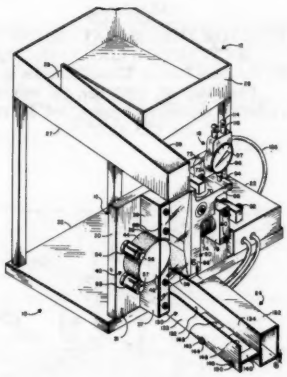
APPARATUS FOR COMPRESSION TESTING AND SORTING GOLF BALLS

Emil M. Valehrach, Phoenix, Ariz., assignor to Karsten Solheim, Phoenix, Ariz.

Filed May 1, 1984, Ser. No. 605,907

Int. Cl.[4] B07C *5/34;* **G01N** *3/08*

U.S. Cl. 209—599 **40 Claims**



1. An apparatus for testing the compressibility of a golf ball comprising:

(a) drive means for defining at least a portion of one side of a golf ball movement path and for driving the golf ball to be tested through at least that portion of the golf ball movement path;

(b) lever means in spaced relationship with said drive means and including a load arm having a bearing surface which defines the opposite side of the golf ball movement path, said lever means further including a fulcrum means about which it is pivotably movable toward and away from said drive means;

(c) biasing means in engagement with said lever means for yieldably biasing said lever toward said drive means;

(d) stop means for limiting the biased movement of said lever means toward said drive means to form a restricted gap in the golf ball movement path which is smaller than the diameter of the golf ball to be tested so that upon driving of the golf ball through the restricted gap said lever means will be deflectingly moved away from said drive means an amount indicative of the compressibility of the golf ball being tested; and

(e) sensing means in engagement with said lever means for detecting and providing indications of the amount of deflected movement of said lever means when the golf ball to be tested is driven through the restricted gap defined by said drive means and said lever means.

13. An apparatus as claimed in claim 1 wherein the indications provided by said sensing means includes a first electrical indication for amounts of deflected movement between a relatively low predetermined value and a relatively higher predetermined value and a second electrical indication for amounts of deflected movement above the relatively higher value.

16. An apparatus as claimed in claim 13 and further comprising:

(a) a control circuit means coupled to receive the first and second electrical indications from said sensing means for producing a first control signal in response to a received first electrical indication and a second control signal in response to a received second electrical indication; and

(b) golf ball sorting means for receiving the golf ball to be tested subsequent to the testing thereof and having first, second and third golf ball outlet openings, said golf ball sorting means having means coupled to receive the first and second control signals from said control circuit means for selectively directing the receivable golf ball to said first golf ball outlet opening upon receipt of the second control signal, to said second golf ball outlet opening upon receipt of the first control signal and to said third golf ball opening in the absence of the receipt of the first and the second control signals.

4,555,029

APPARATUS FOR THE DISPLAY OR THE STORAGE OF BICYCLES OR LIKE VEHICLES

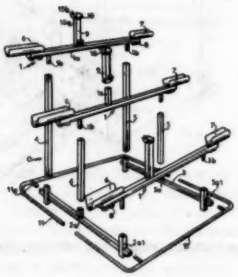
James Fiol, rue Jules Ferrier, 42140 Chazelles sur Lyon, France

Filed Mar. 30, 1983, Ser. No. 480,316

Claims priority, application France, Jul. 26, 1982, 82 13294

Int. Cl.[4] A47F *2/00*

U.S. Cl. 211—22 **12 Claims**



1. A readily portable and adjustable apparatus for the display and storage of bicycles or similar vehicles, comprising:

a plurality of support elements having a plurality of tubular elements that are provided with a plurality of receiving means for holding a plurality of bicycles vertically; and

a ground abutting framework having two independent elements abutting the ground on which said support elements are removably received, said framework further comprising at least one pair of posts which are received on and cooperate freely with said independent elements and freely rotates with said tubular elements of said supporting elements, wherein said supporting elements cooperate freely with said framework so that said supporting elements can be readily positioned angularly in various configurations for displaying bicycles and folded together for storing and transport of said apparatus.

4,555,030

DISPOSABLE RAZOR RACK

David S. Byrne, Atlantic Highlands, N.J., and Evan N. Chen, Fairfield, Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 17, 1984, Ser. No. 581,403

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—49.1 **2 Claims**

1. A reusable bracket device or rack for containing, stacking and dispensing a plurality of articles such as disposable razors, each razor having a head and a handle defining a T-shaped configuration comprising in combination:

a unitary molded plastic frame having a flat rear wall spaced from a flat front wall, said front wall being intercepted by a diagonal slot terminating in a stop, a side wall and a bottom wall joining said front and rear walls, a ramp parallel to said slot joining said side wall and said bottom wall, a first razor access opening intersecting said slot dimensioned to receive razor heads, said first opening serving dually as a dispensing outlet, a second access opening at said bottom wall operative to receive a portion of at least one of said heads and a plurality of razors contained in said frame, each said razor head having been received at said first access opening and having traversed said ramp and said slot in response to gravity, said bottom wall, said second access opening and said stop cooperating to stack the razors on the ramp automatically and to align all heads in horizontal, parallel tiers within said frame and said handles in vertical, parallel array outside said frame.

4,555,031

VEHICULAR CRANE OF HIGH CARRYING CAPACITY HAVING AN EXTENSIBLE ARM

Helmüt Blase, Sande, and Peter Eiler, Oldenburg, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,115

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237706

Int. Cl.[4] B66C *23/78, 23/04*

U.S. Cl. 212—189 **4 Claims**

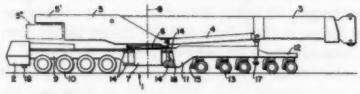
1. A vehicular crane of high carrying capacity, said crane having an extensible arm which is equipped with luffing cylinders and drive units, and is connected with a first undercarriage via a frame part which carries a pivot mounting for said arm, with said undercarriage having a longitudinal axis as well as a front portion and a rear portion, and said frame part having a first drive side and a second side; said crane in combination further comprising:

two carrier supports, in the form of wheeled swivel supports, which are connected to said second side of said frame part in such a way that they can swivel relative thereto; with said drive side of said frame part being rigidly connected with said front portion of said undercarriage;

vertically adjustable first ground support elements connected with said wheeled swivel supports;

swiveling first undercarriage wheels connected with said wheeled swivel supports, said first undercarriage wheels forming a plurality of wheel sets, each of which comprises at least one pair of wheels; the wheels of a given wheeled swivel support having direction thereof adjustable in common as to direction of travel parallel to the longitudinal axis of the undercarriage;

respective swivel connections, one for effecting the mounting of each wheel set with its wheeled swivel support; said first undercarriage wheels and said swivel connections being disposed below their wheeled swivel support;



at least one vertically adjustable second ground support element provided on said front portion of said undercarriage;

second undercarriage wheels connected with said front portion of said undercarriage, with the diameter of said first undercarriage wheels of said wheeled swivel supports being less than the diameter of said second undercarriage wheels of said front portion of said undercarriage, all of said wheels being effective simultaneously and together with the extensible arm having a sufficient stroke length and a maximum crane carrying capacity of greater than 250 metric tons for which at least three-point support of the undercarriage can be realized; and

a wheel support detachably connected with said rear portion of said undercarriage, and which is located accordingly relative to the longitudinal axis of said undercarriage; said drive side of said frame part being provided with connections to which can be attached additional swivel supports in the operating position of said crane.

4,555,032

HEAVY LIFT CRANE

Jon L. Mick, Cedar Rapids, Iowa, and Marvin L. Wolf, Houston, Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 24, 1983, Ser. No. 478,193
Int. Cl.⁴ B66C *23/78, 23/72*
U.S. Cl. 212—189 **1 Claim**

1. A heavy lift crane or the like adapted to be moved along a substantially flat surface comprising:

means defining a boom supporting unit mounted on the flat surface for movably supporting a crane superstructure including;

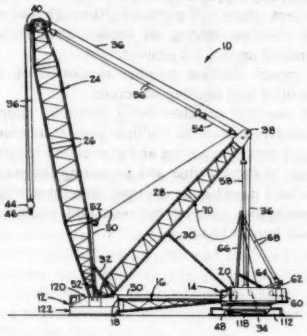
means defining a single rigid annular foot for supporting and stabilizing said unit on said substantially flat surface and being centered about a vertical axis and being of sufficient external dimension to encompass said unit,

means cooperating with said annular foot and a portion of the flat surface that is encompassed within said annular foot for defining a low volume large area pressure chamber,

controllable fluid supply means for directing fluid under pressure into said pressure chamber at least during movement of said boom supporting unit relative to said flat surface with sufficient pressure for supporting a substantial portion of the weight acting on the boom supporting unit but insufficient to raise the annular foot from the surface;

means defining a substantially horizontally elongated connecting link rigidly connected to said boom supporting unit and having a longitudinal axis lying in a vertical plane containing said vertical axis; and

means defining a powered steerable propelling unit connected to said link and controllable to selectively drive



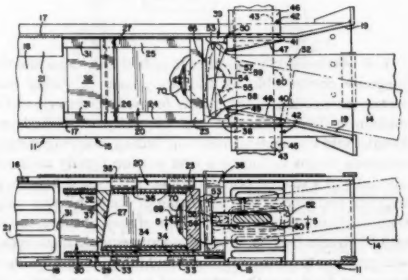
said heavy lift crane along a linear path parallel to said vertical plane, and to pivot the boom supporting unit horizontally about said vertical axis when said fluid supply means provides sufficient pressure within said low volume large area pressure chamber for supporting a sufficient portion of the weight acting on the boom supporting unit to slide said annular foot along said flat surface in response to movement of said powered steerable propelling unit from one position to another position.

4,555,033

SLACKLESS NON-CUSHIONED DRAWBAR ARRANGEMENT FOR RAILWAY CAR UNDERFRAME

Roy W. Miller, Highland, Ind., assignor to Pullman Standard, Inc., Chicago, Ill.

Filed Oct. 3, 1983, Ser. No. 538,549
Int. Cl.⁴ B61G *5/02*
U.S. Cl. 213—51 **17 Claims**



1. In a railway car underframe including a sill structure comprising spaced vertical sill walls and horizontal upper and lower sill walls connected to said vertical walls,

a pocket assembly having a stop end,

a housing structure supported in said pocket assembly, said housing structure including

laterally spaced side walls,

a front transverse wall connecting said side walls,

said sill structure including at a forward end a bell mouth diverging portion spaced from said housing structure,

said forward end of said sill structure including laterally spaced cheek plates supported on said vertical sill walls and including draft key openings in lateral alignment,

the improvement comprising

a drawbar assembly having at a rearward portion thereof a transversely extending elongated slot,

a draft key supported in the laterally aligned openings of said cheek plates and projecting through said slot,

said drawbar having an impact head including laterally spaced impact projections,

an impact reaction member supported on said transverse wall of said housing structure,

said reaction member being pivotally supported on said transverse wall for multiple pivotal movement, and,

keeper means engaging and preventing longitudinal translation of the drawbar and providing for pivotal movement of said drawbar in multiple directions while maintaining contiguous contact between said reaction member and said impact head.

4,555,034

BEER MUG

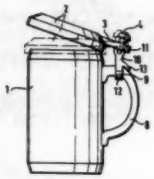
Ludwig Gerhards, Ransbach-Baumbach, Fed. Rep. of Germany, assignor to Clemens Gerhards Holzwarenfabrik KG, Ransbach-Baumbach, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,472

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3242567

Int. Cl.⁴ B65D *23/12*

U.S. Cl. 215—100 R **2 Claims**



1. A beer mug, comprising a mug body having a handle, a lid hingedly connectable to said body, said lid being made of wood; connecting hinge means formed of water-and-rinsing-medium-resistant material and pivotally supported on said handle, said connecting means including snapping means, said snapping means including a first portion rigidly connected to said lid and a second portion connected to said handle, one of said first and second portions being of elastic plastics and being snappingly connectable to another of said portions to connect said lid to said body and being disconnectable from another of said portions to instantly release said lid from said body; and an operating knob rigidly connected to said one elastic portion and operated to attach or release said one elastic portion from said another portion, said second portion being a pivoting arm formed of water-and-rinsing-medium-resistant elastic material and including a fork-like portion formed with a slot and with opposite holding projections in said slot, said lid having a connecting extension forming said first portion and provided with a hole, said fork-like portion being adapted to be releasably snapped into said extension so that said projections are snapped into said hole.

4,555,035

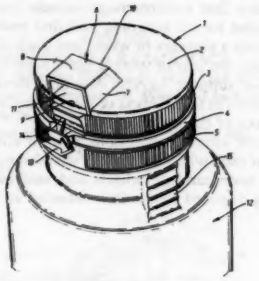
CONTAINER CLOSURE WITH TUNNEL MEMBER

Eugene E. Davis, Ilford, England, assignor to Johnsen & Jorgensen (Plastics) Limited, England

Filed Nov. 26, 1984, Ser. No. 674,670

Int. Cl.⁴ B65D *55/02*

U.S. Cl. 215—215 **26 Claims**



1. A child-resistant closure for a container which, when in operative position, closes the mouth of the container and which is adapted to be removed from said container to open said mouth without mutilation of said closure by turning said closure relatively to said container into a predetermined position from which said closure may be removed upwardly, said closure being adapted to repeatedly and resealably open and close said mouth of said container, said closure including tunnel means defined by side walls, a top wall and a bottom wall all extending substantially horizontally across said closure, and said tunnel means side, top and bottom walls defining an opening for insertion of ordinary household objects such as the handle of a spoon, a key or the like to aid in manipulating said closure while at the same time not interfering with the use of said closure without the use of any such inserted household object at the option of the user.

4,555,036

SAFETY CLOSURE

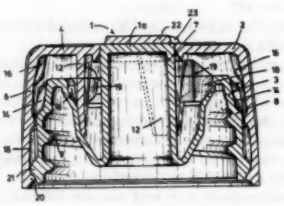
Henricus A. M. Bekkers, Mierlo, and Tjerk Reyenga, Oostvoorne, both of Netherlands, assignors to Technoplast B.V., Monster, Netherlands

Filed Nov. 16, 1984, Ser. No. 671,944

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417184

Int. Cl.⁴ B65D *55/02*

U.S. Cl. 215—220 **3 Claims**



1. In a safety closure, particularly safe in the hands of children to safely close containers, which closure comprises an assembled combination of an inner cap housed in and surrounded by an outer cap and whereby the inner cap is provided at its top side with a closed cylindrical portion and a skirt portion having at its inner side a threaded portion to screw

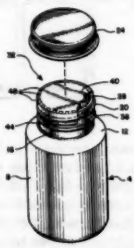
upon the mouth of a container, an intermediate wall portion comprising a conical part integrally interconnecting said skirt portion and said cylindrical portion, the outer cap being provided with a top wall end portion having a central opening and also a cylindrical skirt portion which extends from the edge of the top wall end portion, the outer cap being in sliding engagement with and guided by the cylindrical portion of the inner cap, the top wall end portion of the outer cap further having inwardly extending resilient lips which point into the space created between the cylindrical portion and the intermediate wall portion of the inner cap, said lips cooperating with the conical portion of the intermediate wall portion in such manner that when the closure is in repose the upper part of the cylindrical portion on the inner cap and the top end wall portion of the outer cap lie substantially in the same plane and when a downward pressure is exerted on the outer cap said lips are guided along the conically shaped intermediate wall portion on the inner cap and create a restoring force, the skirt portion of said inner cap being provided with a first set of radial rib shaped teeth, the cylindrical skirt portion of the outer cap being provided with a second set of radial rib shaped teeth, said first and second sets of rib like teeth interengaging only when the outer cap is pressed downwardly a predetermined distance, the improvement comprising a third set of radial rib shaped teeth provided on the surface of the intermediate wall portion of the inner cap facing the cylindrical portion, and tangentially extending protrusions provided on the resilient lips, said third set of teeth and protrusions being constructed and dimensioned axially for interengagement when the outer cap is in repose and when it is pressed down to interengage the first and second sets of teeth.

4,555,037

TAMPER EVIDENT INNER SEAL FOR CONTAINERS

John T. Rhees, 795 Southampton, Farmington, Utah 84025

Filed Jun. 7, 1984, Ser. No. 618,073
Int. Cl.[4] B65D *23/00*
U.S. Cl. 215—232 17 Claims



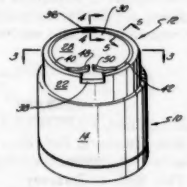
1. A tamper-evident seal for use on a container which includes a hollow body for holding material, a neck at one end extending from the body to terminate in a lip and circumscribing an opening through which material is inserted into and retrieved from the container, and a cap for placement over the opening onto the neck, said seal comprising a sheet of material secured over the opening of the container onto the lip, with the peripheral portions of the material extending downwardly about and adhering to the exterior of the side walls of the neck, said sheet of material being weakened at locations generally over the lip of the container.

4,555,038

TAMPER-EVIDENT RESEALABLE CAP

James H. Nagel, Jr., 7131 Cambria Cir., Orange, Calif. 92669

Filed Jul. 20, 1984, Ser. No. 632,947
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—235 8 Claims



1. A resealable container cap for readily indicating when a container has been previously opened, comprising:

a skirt portion adapted for permanent attachment to a container about an opening in the container;

a plug portion integrally formed with and disposed within the skirt portion for selectively engaging a wall of the container to sealingly close the container opening;

two score lines joined by a tear strip disposed therebetween and separating said skirt and plug portions;

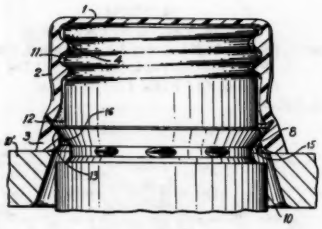
wherein initial removal of the plug portion from the skirt portion to unseal the container opening requires removal of the tear strip that irrevocably disjoins the skirt and plug portions along the score lines to form means for indicating that the container has been previously opened upon repositioning the plug portion into the skirt portion to sealingly close the container opening.

4,555,039

PILFER-PROOF CAP

Vincent N. Conti, West Hempstead, N.Y., assignor to American Safety Closure Corp., Farmingdale, N.Y.

Filed Jul. 13, 1982, Ser. No. 397,761
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 11 Claims



1. The improvement in a plastic pilfer-proof cap molded on an internal mold member and adapted for use with a container having a threaded neck portion and a radially inwardly extending shoulder disposed below the threaded neck portion and facing axially away therefrom, the cap having a top wall, a depending skirt with internal threading for engagement with the threaded neck portion of the container and a pilfer-proof ring connected to the lower end of the skirt by fragible means and having radially inwardly extending locking means adapted to slide over the shoulder upon threading the cap onto the container and to engage against the shoulder upon unthreading of the cap to cause the frangible means to break and the ring to separate from the skirt of the cap, the improvement wherein:

(a) the frangible means is aligned axially with the skirt and ring;

(b) the locking means includes a radially inwardly directed protrusion extending around the internal periphery of the ring; and

(c) the protrusion, in axial cross-section, has a generally conical shape with the radially inwardly facing surface having multiple circumferentially spaced areas disposed radially outwardly of remainder of said surface, said areas each defining a radially inwardly facing curved portion and the remainder of said surface defining chordal portions.

4,555,040

GLASS WITH STEM, PARTICULARLY A WINE GLASS

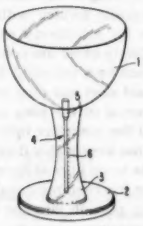
Rolf Butenschön, Hamburg, Fed. Rep. of Germany, assignor to GIVAG Gastro-Installationen-Vertrieb (Deutschland) GmbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 5, 1984, Ser. No. 647,434

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1983, 3332012

Int. Cl.⁴ B65D *23/16*

U.S. Cl. 215—365 **4 Claims**



1. A receptacle for holding a liquid, comprising:

a bowl for holding the liquid;

a stem attached to said bowl; and

a thermometer having a bulb located in the proximity of said bowl and a calibrated capillary tube extending along said stem.

4,555,041

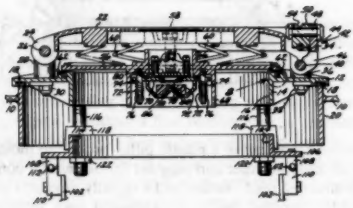
TANK VALVE APPARATUS

Herman D. Muehl, 10851 Drury La., Lynwood, Calif. 90262

Filed Jul. 20, 1984, Ser. No. 632,714

Int. Cl.⁴ F16K *17/196, 17/36*

U.S. Cl. 220—204 **8 Claims**



1. A tank valve apparatus for a tanker truck or the like, said apparatus comprising:

dome mounting means for securement to a tank to define a dome opening into said tank, and including a dome bridge pivotable into and out of overlying relation to said dome opening;

a dome cap carried by said dome bridge and having a closed position seated across said dome opening, said dome cap being movable relative to said dome bridge to an open position away from said dome cap opening for excessive pressure venting of said tank, said dome cap including a negative pressure opening;

bias means interposed between said dome bridge and said dome cap and urging said dome cap into said closed position of said dome cap;

a vacuum valve carried by said dome cap and having a closed position seated across said negative pressure opening, said vacuum valve being movable relative to said dome cap to an open position away from said negative pressure opening for entry of air into said tank under negative tank pressures, said vacuum valve including a positive pressure opening;

bias means interposed between said dome cap and said vacuum valve and urging said vacuum valve into said closed position of said vacuum valve;

a pressure valve carried by said vacuum valve and having a closed position seated across said positive pressure opening, said pressure valve being movable relative to said vacuum valve to an open position away from said positive pressure opening for venting of air from said tank under positive tank pressures;

an inertia valve carrier carried by said vacuum valve and defining vent passages from said tank to said positive pressure opening, said valve carrier including first guide surfaces directed toward said positive pressure openings; and

an inertia valve carried by said valve carrier and including second guide surfaces slidable upon said first guide surfaces, upon tilting of said inertia valve carrier, to a closed position sealing off said positive pressure opening.

4,555,042

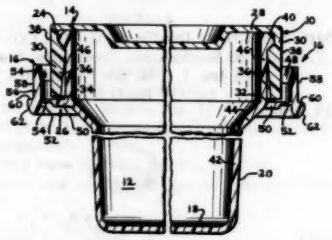
TAMPER RESISTANT CONTAINER AND CLOSURE ASSEMBLY

Willard J. Rathbun, 3721 Gary Dr., Castalia, Ohio 44824

Filed Jan. 28, 1985, Ser. No. 695,711

Int. Cl.⁴ B65D *17/42*

U.S. Cl. 220—277 **4 Claims**



1. A tamper resistant container and closure assembly comprising a container, a lid and a tamper resistant protective band, said container having a base and a sidewall which terminates in an open end, said annular protective band being positioned about and spaced apart from said container sidewall near said open end, said annular protective band being attached to said container sidewall by a continuous annular transverse projection extending horizontally from the exterior of said container sidewall, said continuous annular transverse projection being of a non-tearable thickness, whereby such transverse projection must be severed with a cutting tool to detach said protective band from said container; said lid having a top and an annular lip depending from said top, said lip having an interior surface, an exterior surface and a bottom edge, said container sidewall, said continuous annular transverse projection and said annular protective band forming a channel about the exterior of said container adapted to receive said bottom edge of said depending lip of said lid thereby preventing unauthorized removal of said lid prior to removal of said annular

protective band, whereby removal of said annular protective band is accomplished by using a cutting tool to sever said continuous annular transverse projection thereby causing said annular protective band to be separated from said container and exposing said bottom edge of said depending annular lip of said lid.

4,555,043

ANTI-SPILL RECLOSEABLE CONTAINER

Daniel Bernhardt, P.O. Box 681, Rutland, Vt. 05701

Filed Nov. 29, 1984, Ser. No. 676,737
Int. Cl.⁴ B65D *43/02*
U.S. Cl. 220—306 **10 Claims**

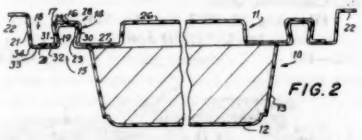


FIG. 2

1. A resealable, spill-resistant container of deformable polymeric material comprising a bottom, upwardly directed side walls extending therefrom, the uppermost ends of said walls defining an open mouth, a rim configuration extending outwardly from said side walls and surrounding said mouth, a perimetrical lid receiving portion formed on said rim configuration outwardly adjacent said mouth, a lid member including a perimetal seal portion sealingly received in said receiving portion and a lid lock assembly integrally formed on said rim configuration, said lock assembly including a branch portion extending laterally outwardly beyond said seal portion at a level below said seal portion, a leg member extending upwardly from said branch portion, the uppermost end of said leg member being disposed at a height above said seal portion, the area between said leg member and seal portion being flexible, said leg member being positioned to be shifted into upwardly lapping position of said seal portion responsive to pressure exerted thereagainst in the direction of the interior of said container.

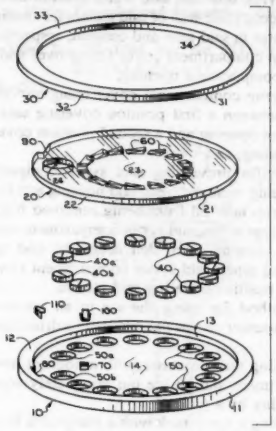
4,555,044

TAMPER-PROOF PILL DISPENSER

John M. Pearo, 7653 S. Arbory La., Laurel, Md. 20707

Filed Aug. 8, 1983, Ser. No. 521,340
Int. Cl.⁴ B65D *83/04*
U.S. Cl. 221—19 **8 Claims**

1. A tamper-proof pill dispenser comprising:
a base having means for holding pills in a plurality of serial positions in generally circular arrangement;
a cover supported above said base for rotary motion and including a dispensing hole through which pills are dispensed;
attachment means for affixing said cover to said base while permitting rotary motion of said cover with respect to said base; and
stop means for permitting rotation of said cover with respect to said base in only one direction to place said dispensing hole in serial register with the serial positions and for preventing further rotation of said cover in either direction after said dispensing hole has been placed in register with the last serial position.

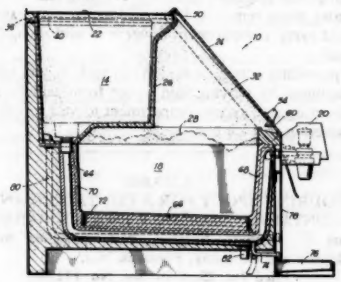


4,555,045

ICE-COOLED DISPENSING SYSTEM

Joseph J. Rodth, Barkhamsted, Conn.; Ira A. Smith, Jr., Marietta, and Donald F. Cornett, Cartersville, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Sep. 30, 1983, Ser. No. 537,925
Int. Cl.⁴ B67D *5/56*
U.S. Cl. 222—1 **22 Claims**



1. An ice-cooled gravity beverage dispenser comprising:
(a) a housing;
(b) a syrup compartment in said housing and having an opening for providing access thereto, said syrup compartment being adapted to receive at least one syrup tank therein;
(c) at least one syrup tank located in said syrup compartment and having a removable lid thereon;
(d) an ice bin in said housing and having a cold plate wall and an opening for providing access thereto, said ice bin being adapted to receive cooling ice therein, said syrup compartment including wall means for completely separating said syrup compartment from said ice bin;
(e) at least one dispensing valve mounted on said housing;
(f) a syrup tube having an I.D. of from about ⅜ inch to about 1¼ inch for feeding syrup from said syrup tank to said dispensing valve;

(g) a water conduit for feeding water to said dispensing valve;

(h) said syrup tube and said water conduit being embedded in said cold plate wall of said ice bin for cooling any syrup and water in said tube and conduit, respectively;

(i) a syrup compartment cover fitting over and closing said syrup compartment opening;

(j) said syrup compartment cover being movable back and forth between a first position covering said syrup compartment opening and a second position covering said ice bin opening; and

(k) means for preventing said syrup compartment cover from being removed from said housing and for preventing said syrup tank lid from being removed from said syrup tank except when said syrup compartment cover is in said second position, such that access to said syrup tank is provided when said syrup compartment cover is in said second position covering said ice bin.

18. A method for using the ice in an ice-cooled gravity beverage dispenser also as potable ice in a drink comprising the steps of:

(a) providing said dispenser with a housing having a syrup compartment and an ice bin completely separated from each other by a wall;

(b) providing a syrup tank with a removable lid in the syrup compartment;

(c) cooling syrup by feeding the syrup from the syrup tank to a dispensing valve mounted on the housing through a syrup tube having an I.D. of from about ⅜ inch to about 1¼ inch embedded in a cold plate wall of said ice bin;

(d) cooling water by feeding the water to said dispensing valve through a water conduit embedded in said cold plate wall of said ice bin;

(e) providing a cover on the syrup compartment adapted to move back and forth between a first position covering the syrup compartment and a second position covering the ice bin;

(f) providing means for preventing said cover from moving off of said dispenser and for preventing said syrup tank lid from being removed from said syrup tank except when said syrup compartment cover is in said second position; and

(g) providing access to said syrup tank in said syrup compartment by moving said cover from said first position covering said syrup compartment to said second position covering said ice bin.

4,555,046

POURING SPOUT FOR A CONTAINER AND A CONTAINER ASSEMBLY INCLUDING SAME

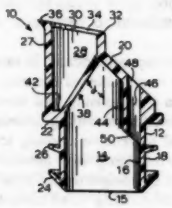
Michael C. Bennett, Summit, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Jul. 25, 1980, Ser. No. 172,309

The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.

Int. Cl.⁴ B65D 5/72

U.S. Cl. 222—189 **11 Claims**



1. A pouring spout for use with a container for the withdrawal of a liquid from the container under conditions of controlled flow, which comprises:

a body side wall enclosed at one end by a top wall and defining a first fluid channel;

a spout member integrally formed with said top wall extending outwardly from said top wall and defining a second fluid channel having a fluid outlet orifice, said channels being in fluid communications with each other and defining a fluid passageway for said liquid;

screen means disposed in said fluid passageway at the interface between said first and said second fluid channels for removal of solids from said liquid; and

vent means for providing pressure equalization between said passageway and ambient atmosphere.

4,555,047

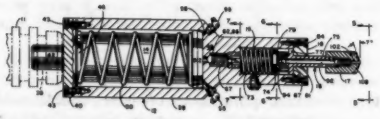
AUTOMATIC TOOLCHANGER TAPPING LUBRICANT DISPENSER

Harry E. Ackley, Sardinia, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 19, 1983, Ser. No. 524,756

Int. Cl.⁴ B67D 5/40

U.S. Cl. 222—192 **11 Claims**



1. An apparatus for applying a tapping lubricant from a dispenser into a hole to be tapped comprising a machine tool with a revolvable spindle, a tool store for storing a plurality of tools each having a toolholder, said dispenser being a tool in said store, and a numerically controlled automatic toolchanger;

said numerically controlled automatic toolchanger having means to remove said dispenser from said tool store, insert it in said spindle, manipulate it to dispense tapping lubricant and thereafter return said dispenser to the tool store;

said dispenser comprising toolholder means at one end of said dispenser for connection with said spindle;

pump plunger means at the other end of said dispenser with a dispensing end outermost;

an elongated housing extending between said toolholder and plunger that has walls defining therewithin a reservoir adjacent said toolholder means, a pump chamber adjacent said other end, and an exit passage between said reservoir and said pump chamber;

first valve means responsive to pressure increase in said pump chamber to close said exit passage;

reload biasing means for urging material out of said reservoir past said valve means through said exit passage and into said pump chamber;

said pump plunger means extending into said pump chamber through said housing for said dispensing end supported for rotation and reciprocation relative to said housing and having a length sufficient to permit reciprocation relative to said chamber while maintaining outside of said housing a portion of such length that includes said dispensing end at said other end;

that end of said pump plunger means within said pump chamber forming a pump piston to reciprocate with said plunger within said pump chamber;

a pump conduit within said plunger establishing communication between said dispensing end and said chamber upstream of said piston;

plunger biasing means for urging said pump plunger away from said toolholder; and

second valve means disposed in said pump conduit, normally

closed but openable in response to fluid pressure increase within said chamber.

6. An apparatus for applying tapping lubricant into a hole to be tapped by using a numerically controlled automatic tool-changer system to remove such apparatus from a tool store, insert it in a revolvable spindle, manipulate it to dispense tapping lubricant, and then return the apparatus to the tool store wherein the apparatus comprises:

toolholder means at one end of said apparatus for connecting with a toolholder which is insertable in the revolvable spindle of a machine tool;

elongated housing assembly secured to said toolholder and defining therewithin a reservoir adjacent said toolholder and a pump chamber at that end of the housing most remote from said toolholder and having a partition separating said pump chamber from said reservoir;

a reload passage through said partition connecting said reservoir to said pump chamber;

first check valve means disposed within said reload passage to prevent flow from said pump chamber into said reservoir;

a pump plunger means extending out of said pump chamber through said housing assembly;

a pump piston mounted on said pump plunger means within said pump chamber and engaging slidably the walls of said pump chamber;

a thrust bearing means engageable with the end of said pump plunger means disposed within said chamber that moves with said plunger means;

a dispensing tip secured on the outermost portion of said pump plunger means and outside of said chamber;

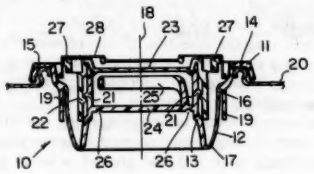
said pump plunger means having therewithin an exit passage communicating within said pump plunger means on the upstream side of said piston to the exit passage in said tip.

4,555,048

VENTED NESTABLE POURING SPOUT

Martin E. Hamman, and Gary M. Baughman, both of Auburn, Ind., assignors to Rieke Corporation, Auburn, Ind.

Filed May 16, 1984, Ser. No. 610,688
Int. Cl.⁴ B67D *3/00*
U.S. Cl. 222—478 **12 Claims**



1. A pouring spout for use with a container, comprising:

a spout having means for alternately disposing said spout in a nested orientation or in an extended pouring orientation, means for securing said pouring spout to said container; and

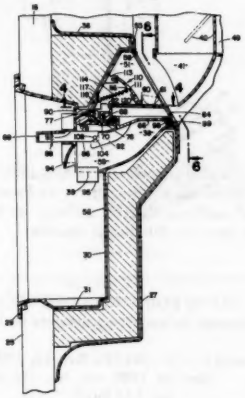
a plurality of circumferentially spaced ears, said ears being movably attached with respect to said spout and extendng therefrom without interference with said spout when said spout is in its nested orientation, and said ears extending inwardly substantially perpendicular to the longitudinal axis of said spout and cooperating to define a restricted flow aperture for the outflow of liquid and a plurality of peripheral vent openings for the inflow of air when said spout is in its extended pouring orientation.

4,555,049

ICE DOOR MECHANISM

Harold S. Mawby, and Carl W. Frisbie, both of Belding, Mich., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 18, 1984, Ser. No. 571,679
Int. Cl.⁴ F25C *5/18*
U.S. Cl. 222—517 **8 Claims**



1. A refrigerator having a cabinet defining an opening;

a main door mounted on said cabinet to close said opening;

an ice dispensing apparatus in said chamber;

a delivery chute in said main door;

an inner door movable to a first substantially horizontal closed position to block said delivery chute against the passage of ice pieces therethrough and pivotably mounted to allow the inner door to be placed in a second open position allowing the passage of ice through said delivery chute;

joining means pivotably joining the inner door to a support member within said delivery chute;

an ice guard comprising a sweeper member which is pivotably mounted on a bracket within said delivery chute, the sweeper member having a portion extending substantially the width of and resting on said inner door movable relative to said inner door, and the sweeper member being resiliently biased against said inner door to sweep along the inner door as the inner door is moved between the first and second position.

4,555,050

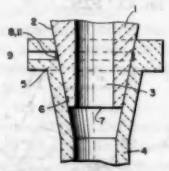
CLOSURE MECHANISM WITH GAS SEAL

Bernhard Schiefer, Viersen, Fed. Rep. of Germany, and Herbert Bumberger, Linz, Austria, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany and Voest-Alpine AG, Linz, Austria

Filed Jul. 8, 1983, Ser. No. 512,127
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1982, 3226047
Int. Cl.⁴ B22D *41/08*
U.S. Cl. 222—597 **8 Claims**

1. In a closure mechanism of the type operable alternately for discharging molten metal from a molten metal containing vessel and for blocking such discharge, said closure mechanism being of the type including a conical discharge nozzle and a shielding tube fitted over the exterior of said discharge nozzle, the improvement of means for preventing exterior air from entering between said discharge nozzle and said shielding tube into the interior of said shielding tube, said preventing means comprising:

a conical joint formed by conical surfaces of said discharge nozzle and said shielding tube, said conical surfaces of said discharge nozzle and said shielding tube being closely complementary and in abutment, thereby forming a snug said conical joint; and



at least one ring-shaped seal in said joint, said ring-shaped seal comprising an annular recess formed in one of said conical surfaces, thereby defining an annular chamber, and an inert gas filling said chamber.

4,555,051

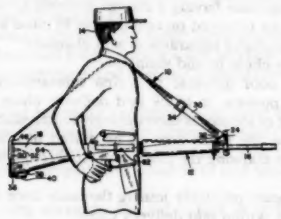
SLING FOR SHOULDER WEAPON

David A. Johnson, Salem, Oreg., assignor to J.F.S., Inc., Salem, Oreg.

Continuation of Ser. No. 561,316, Dec. 14, 1983. This application Mar. 18, 1985, Ser. No. 713,094

Int. Cl.[4] F41C *27/00*

U.S. Cl. 224—150 **13 Claims**



1. A sling assembly for carrying a weapon of the type having a front portion and a butt stock located rearwardly from said front portion and including a butt end and a bottom portion, the sling assembly comprising:

(a) a flexible sling strap member having a pair of opposite end portions and an intermediate portion;

(b) sling swivel means attached to a first one of said pair of opposite end portions for connecting said first one of said pair of opposite end portions to said butt stock;

(c) attachment means for fastening the other one of said pair of opposite end portions to said front portion of said weapon;

(d) detachable mechanical fastener means, including a pair of cooperatively mating portions; and

(e) a sleeve surrounding a portion of said sling strap member intermediate said opposite end portions thereof, a first one of said cooperatively mating portions being mounted on said sleeve and said sleeve being movable along said sling strap member intermediate said opposite end portions thereof and a second one of said cooperatively mating portions being fixedly located on said butt end of said butt stock, for selectively detachably holding said intermediate portion of said sling strap member in a position rearwardly adjacent said butt end of said butt stock and extending upwardly therealong while said opposite end portions are fastened to said butt stock and said front portion by said sling swivel means and said attachment means.

4,555,052

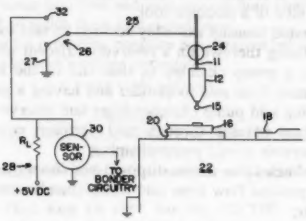
LEAD WIRE BOND ATTEMPT DETECTION

John A. Kurtz, Gorham; Donald E. Cousens, Saco, and Mark D. Dufour, Portland, all of Me., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Feb. 28, 1983, Ser. No. 470,217

Int. Cl.[4] H01L *21/90*

U.S. Cl. 228—104 **17 Claims**



1. Apparatus for sensing and detecting bond attempts and weld attempts during bonding and welding of lead wire respectively to a microcircuit chip and to the lead frame on which the chip is mounted, said lead wire held during bonding and welding in the capillary wire holding and bonding tool of a bonding machine, comprising:

means isolating the lead wire from ground potential while the lead wire is held in the bonding tool and bonding machine;

first circuit means comprising ground coupling means, ground isolated voltage source means, and switching means for electrically switching and coupling the lead wire held in the bonding tool to the ground coupling means or to the ground isolated voltage source means:

second circuit means comprising current sensing means for sensing the electrical condition of the lead wire when the lead wire is electrically coupled to the ground isolated voltage source means, said sensing means operatively responsive to the electrical condition of the lead wire for detecting the effective resistance in the lead wire:

indicator means coupled to said second circuit means, for indicating the detection of high resistance in the lead wire after a bond attempt, said indicator means further operative to indicate the detection of low resistance in the lead wire after a weld attempt;

said second circuit means comprising operational amplifier means having inputs coupled in series respectively with the lead wire and the ground isolated voltage source means, shunt resistance means connected across the inputs to said operational amplifier means for sensing current in the lead wire, and a first pair of transistor means (Q5,Q6) coupled in parallel with each other to the output of said operational amplifier means, said first pair of transistor means being in alternately opposite conducting states in response to the output of said operational amplifier means after the ball bonding operating mode and the wedge bonding operating mode respectively for controlling said indicator means according to the current level and therefore the resistance in the lead wire;

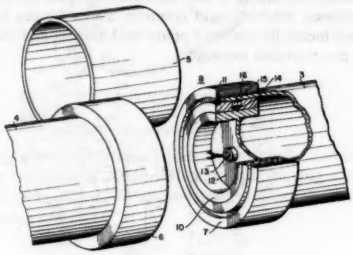
and third circuit means for determining whether the lead wire bond being sensed and detected is a ball bond or a wedge bond and alternately controlling which of said first pair of transistor means is conducting and which is non-conducting.

4,555,053

METHOD OF JOINING TOGETHER TWO PIPE ENDS TO FORM A PIPE OF METAL

Per I. Persson, Nora, and Bengt Persson, Olofström, both of Sweden, assignors to Nitro Nobel AB, Gyttorp and AB Volvo, Gothenburg, both of, Sweden

Filed Jun. 8, 1984, Ser. No. 618,516
Claims priority, application Sweden, Jun. 9, 1983, 8303263
Int. Cl.[4] B23K *20/08*
U.S. Cl. 228—107 10 Claims



1. Method of joining together two pipe ends to form a pipe, said pipe ends being opposite each other and fixedly located at a distance from each other making conventional welding impossible, characterised in that a splicing tubr or intermediate section (5) is prepared, having a length substantially corresponding to the distance between said two pipe ends (3 and 4), the length of the splicing tube (5) can be joined to an opposing pipe end (3 or 4) by means of explosive welding, placing said splicing tube (5) between said pipe ends (3 and 4) and locating two inner peripheral bodies to bridge the gaps between the ends of the splicing tube (5) and the opposite pipe ends (3 and 4), providing outer peripheral support means (6 and 7) functioning as support and igniting an inner explosive charge (10) at each end of the splicing tube (5) to to produce an explosive weld so that each inner peripheral body (11) forms a bond between each pipe end and each splicing tube end.

4,555,054

PROCESS AND APPARATUS FOR FABRICATING OPTICAL FIBER CABLES

Joseph Winter, New Haven, and Michael J. Pryor, Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 413,846, Sep. 1, 1982, Pat. No. 4,508,403, which is a continuation-in-part of Ser. No. 324,242, Nov. 23, 1981, abandoned. This application May 24, 1983, Ser. No. 497,535
Int. Cl.[4] H04B *9/00;* B23K *3/06*
U.S. Cl. 228—148 24 Claims

17. A process for fabricating an optical fiber cable, said process comprising:

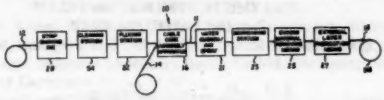
forming a tube having a seam formed by spaced apart tube portions from a metal or metal alloy strip material;

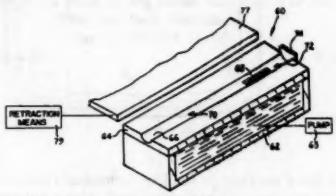
inserting at least one optical fiber into said tube;

providing a source of molten, metallic sealing material and a plate having a groove with slotted and unslotted portions over said source;

applying pressure to said sealing material in said source with a pump, said pressure creating a wave of flowing molten sealing material; and

placing said tube seam in contact with said wave of flowing molten sealing material so that said sealing material contacts and substantially fills said seam, said placing step comrising aligning said tube and seam with said moving molten sealing material to minimize the likelihood of said sealing material flowing about and adhering to portions of said tube other than said seam by passing said tube





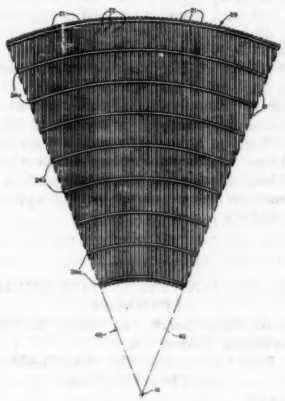
through said groove so that said seam contacts said slotted portion of said groove.

4,555,055

METHOD OF MAKING CENTRIFUGE SCREEN BASKETS

James D. Connolly, P.O. Box 1238, Princeton, W. Va. 24740

Division of Ser. No. 405,928, Aug. 6, 1982. This application Aug. 8, 1984, Ser. No. 638,855
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—155 3 Claims



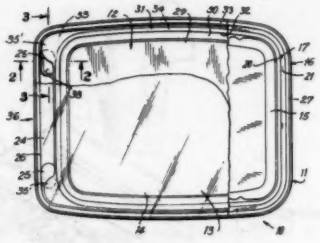
1. A method of making a frusto-conical centrifuge screen basket of side-connected segments formed of wedge-shaped screen wires connected and backed by tie bands welded thereto, comprising fabricating each segment in the flat by clamping laterally spaced screen wires to a flat work surface and fusion welding laterally spaced tie band sections to said screen wires, and so precurving and during welding positioning said tie band sections as to form in the finished basket a plurality of laterally spaced continuous circumferential tie bands each centered on and perpendicular to the basket's axis.

4,555,056

TAMPERPROOF FOOD PACKAGE

Daniel Bernhardt, P.O. Box 681, Rutland, Vt. 05701

Filed Oct. 14, 1983, Ser. No. 542,138
Int. Cl.[4] B65D *5/64, 43/06*
U.S. Cl. 229—45 R **4 Claims**



1. A food package or the like formed of resilient polymeric material comprising a receptacle including a bottom, side wall portions and an integral peripheral rim assembly extending laterally outwardly from the uppermost end of said side wall portions, said rim assembly including a circumferential rib member projecting upwardly from the uppermost edge of said wall portions, said rib member being of the general configuration of a dovetail having downwardly directed converging legs, a generally horizontally directed bridge portion connecting the uppermost ends of said legs, a horizontal land portion extending outwardly from the outermost of said legs, a circumferentially extending inverted U configuration defining an outward extension of said land portion, said U configuration including an uppermost generally planar horizontally directed anchor surface, said surface being disposed in a plane proximate to and above the plane of said bridge portion, said land portion including at least one shallow depression, a cap member snapfittedly mounted to said rim assembly, said cap member including a central portion, a circumferential, downwardly concave bead formed in said cap member, said bead encompassing said dovetail configuration therewithin, the concave surfaces of said bead being in stressed engagement with said legs of said dovetail configuration, thereby to urge said cap member downwardly toward said bottom, at least one horizontally directed flange extending outwardly from said bead, said flange being disposed in partial registry with said depression, and a membrane sealingly connected to said anchor surface along a continuous circumferential connection line, said membrane being disposed intimately adjacent the uppermost surface of said bead, thereby to prevent inadvertent disengagement of said bead from said dovetail configuration, all portions of said cap member being disposed beneath a plane tangent to said anchor surface.

4,555,057

HEATING AND COOLING SYSTEM MONITORING APPARATUS

James O. Foster, Falls Church, Va., assignor to JFEC Corporation & Associates, Oakton, Va.

Filed Mar. 3, 1983, Ser. No. 471,930
Int. Cl.[4] G05D *23/00*
U.S. Cl. 236—94 **6 Claims**

1. Apparatus for monitoring operation of a heating and cooling system, the apparatus comprising in combination:

a plurality of sensors, each sensor constructed and arranged to detect a malfunction in a corresponding operational condition of the heating and cooling system and to provide a signal in response thereto;

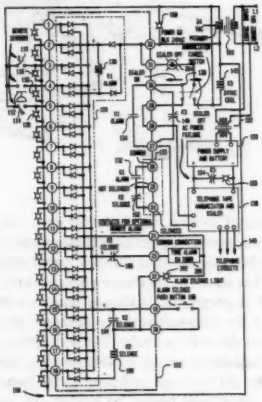
local alarms, each of a plurality of said local alarms being coupled to a corresponding sensor, and constructed and arranged to be activated in response to a malfunction detection signal from said corresponding sensor;

a common alarm system including a telephone having means for dialing a predefined number and conveying a pre-recorded message on said telephone;

means for isolating each sensor from signals directed by other sensors to the common alarm system;

means responsive to any malfunction signal from one of said sensors, for automatically actuating said dialing means to call said predefined telephone number and for conveying a pre-recorded message in response to an off-hook signal received by said means immediately following said call;

wherein upon cessation of said malfunction signal, said means responsive to said malfunction signal automatically releases, resetting said common alarm system including said means for dialing a predefined number and conveying a pre-recorded message;



wherein said common alarm includes a relay coil coupled to receive the signal provided by each sensor detecting a malfunction; and

wherein the isolating means comprises:

four terminal rectifier bridge means for confining current from the primary power source to only local alarms coupled to sensors that detect malfunctions, the relay coil extending across two opposite terminals of the bridge means with alternating current from the primary power source being applied across the other two opposite terminals;

the rectifiers in the bridge means being biased so that the signal from each sensor that detects a malfunction activates the common alarm and the local alarm coupled thereto without activating a local alarm coupled to another sensor.

4,555,058

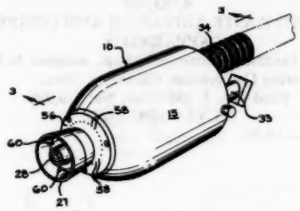
ROTARY ATOMIZER COATER

Richard Weinstein; James W. Davis, both of Toledo, Ohio, and Robert K. Campbell, Temperance, Mich., assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Oct. 5, 1983, Ser. No. 539,283
Int. Cl.[4] B05B *3/10;* **F16J** *15/16*
U.S. Cl. 239—223 **9 Claims**

1. A coating applicator comprising, in combination, a rotary atomizer mounted on a shaft, drive means operatively connected to said shaft to rotate said shaft at high speeds, means for supplying coating material to said rotary atomizer, a pair of spaced bearings rotatably mounting said shaft and a seal assembly between said rotary atomizer and one of said bearings, said seal assembly including a cylindrical bearing cover, said bearing cover including a circular cutting edge adjacent said shaft, and a mating cap member surrounding said shaft adjacent said

bearing cover, said cap member defining a circular sealing shoulder, said cutting edge of said bearing cover engaging and abraiding into said sealing shoulder, whereby coating material is sealed from said one of said bearings, said bearing cover



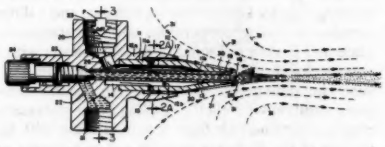
including a circular surface extending outwardly and said cap member including a cylindrical outer wall having a tapered rear end, said tapered rear end engaging said circular surface of said bearing cover.

4,555,059

FLOW-AMPLIFYING LIQUID-ATOMIZING NOZZLE

C. Neal Collins, Goshen, and Joseph E. Peter, Cincinnati, both of Ohio, assignors to Vortec Corporation, Cincinnati, Ohio

Filed Aug. 6, 1984, Ser. No. 638,230
Int. Cl.⁴ B05B 7/00
U.S. Cl. 239—425 **12 Claims**



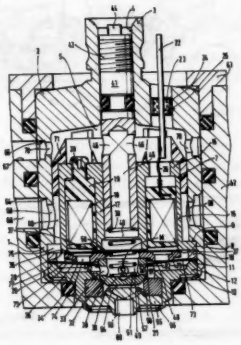
1. A flow-amplifying liquid-atomizing nozzle comprising a tubular body having a generally cylindrical section with an axial bore and a conical, inwardly-tapered nose section at one end of said cylindrical section; said tapered nose section having liquid outlet means for the external discharge of liquid from said nose section; conduit means extending through said bore to said liquid outlet means for delivering liquid to said outlet means; said cylindrical section having a plurality of circumferentially-spaced radial openings communicating with said bore; a collar extending about said cylindrical section; said collar having a flow-directing section and an attachment section; said flow-directing section having a bore sufficiently greater in diameter than the outside of said cylindrical section to define an annular flow-directing passage communicating with said openings and facing towards said nose section; said attachment section being secured to said cylindrical section in fluid-tight sealing relation along the surface of said cylindrical section remote from said nose section; whereby, primary air under pressure supplied to said flow-directing passage through said bore is directed along the surface of said conical nose section to strip liquid from said liquid outlet means as said primary air is being amplified by ambient secondary air entrained thereby.

4,555,060

ELECTROMAGNETICALLY ACTUATED VALVE, IN PARTICULAR A FUEL INJECTION VALVE FOR FUEL INJECTION SYSTEMS

Heinrich Knapp, Leonberg; Rudolf Sauer, Benningen; Rudolf Krauss, Stuttgart, and Udo Hafner, Lorch, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 376,463, May 10, 1982, abandoned. This application Jul. 25, 1984, Ser. No. 633,677
Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118898
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.⁴ F02M 51/00
U.S. Cl. 239—585 **4 Claims**



1. An electromagnetically actuatable valve for fuel injection valves for fuel injection systems of internal combustion engines, having a valve housing, a magnetic winding applied on a core or ferromagnetic material, and an armature which is firmly connected with a valve element said valve element arranged to cooperate with a fixed valve seat, said valve element adapted to freely pass through a guide diaphragm formed of spring-metal and guided by said guide diaphragm, said guide diaphragm having a circumference which is fastened to said housing, said guide diaphragam has an annular fastening zone and an annular inner guide zone of smaller diameter, each of said zones being interconnected by means of radially extending struts which are offset relative to each other arcuately and radially in each of said zones and thereby provided arcuate flowthrough openings, said inner guide zone of said guide diaphragm arranged to rest under spring tension on a concentric guide ring of said armature, said armature further having a surface oriented toward the valve seat whereby said guide diaphragm retains said armature parallel to said valve seat and to an end face of said core of ferromagnetic material, said guide diaphragm further including a centrally disposed annular zone supported by radial struts, which form arcuate flowthrough openings, said centrally disposed annular zone providing an opening through which said value element is guided.

4,555,061

MANURE SPREADER EXPELLER FLAIL

Gilbert W. Linde, Oxford, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 12, 1983, Ser. No. 531,116
Int. Cl.⁴ A01C 15/16
U.S. Cl. 239—675 **1 Claim**

1. A manure spreader comprising:

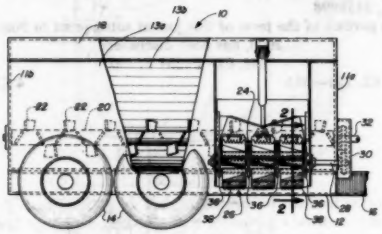
a tank for containing manure, said tank having a front end wall, a rear end wall and side walls;

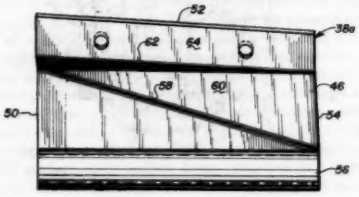
an auger mounted in said tank for moving manure toward an opening formed in one of the side walls of said tank;

expeller means disposed at said opening to throw manure away from said tank;

said expeller means including a plurality of blades connected to and rotatable about a central shaft;

each of said blades having a first edge facing toward said front end wall of said tank, a second edge facing toward said rear end wall of said tank, and first and second planar portions disposed between said first and second edges,





said first and second planar portions being canted in substantially the same direction toward said rear end wall of said tank and angled in substantially the same direction relative to each other and to the longitudinal axis of said central shaft;

each of said blades being bent along first and second generally straight lines extending between said first and second edges to provide said first and second planar portions, respectively, in order to cause said expeller means to throw manure in a lateral and rearward direction with respect to the direction of travel of the manure spreader.

4,555,062

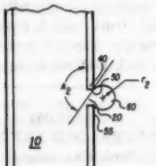
ANTI-WETTING IN FLUID NOZZLES

Young S. You, Fremont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 5, 1983, Ser. No. 482,123

Int. Cl.⁴ E01D *15/18*

U.S. Cl. 239—690 **9 Claims**



1. A nozzle for ejecting a fluid, said nozzle comprising:

a surface in contact with the fluid, which surface is composed substantially of an oxide material; and

ions imbedded in at least a part of the oxide material surface of said nozzle to ionically activate the oxide material surface in the inner region of the nozzle adjacent to the end of the nozzle from which the fluid is ejected.

4,555,063

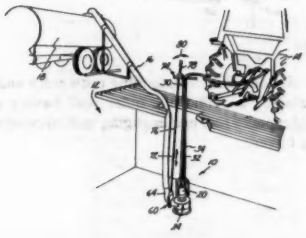
LIQUID WASTE AGITATING AND PUMPING APPARATUS

Michael R. Goettsch, Glenwood, Minn., assignor to Glenwood Manufacturing Corporation, Glenwood, Minn.

Filed Feb. 3, 1984, Ser. No. 576,908

Int. Cl.⁴ B02C *23/36*

U.S. Cl. 241—46.04 **5 Claims**



1. An improved liquid waste agitating and pumping apparatus for pumping and agitating liquid waste contained in an enclosure, the apparatus comprising:

an impeller housing having an inlet for fluid communication with the liquid waste in the enclosure and an outlet for discharge of the liquid waste out of the housing;

impeller means disposed within the housing;

motor means mounted on the housing for rotation of the impeller means and including a shaft assembly connected to the impeller for rotation thereof;

sliding gate valve means externally mounted with respect to the impeller housing, having a stationary guide plate with an opening in fluid communication with the outlet of the housing, fixedly attached to the housing, and a sliding gate member in sliding cooperation with the stationary guide plate and having a discharge conduit means with a fluid passage for discharging the liquid waste from the enclosure, the sliding gate member being slidable between a pump position wherein the opening of the stationary guide plate is positioned for fluid communication with the fluid passage of the discharge conduit and an agitating position wherein the opening of the stationary guide plate is in direct fluid communication with the liquid waste contained in the enclosure and the lowermost portion of the sliding gate member is above the uppermost portion of the opening of the stationary guide plate; and

handle means attached to the sliding gate member for moving the sliding gate member between the pumping position and the agitating position.

4,555,064

PEBBLE-STONE CRUSHING DEVICE FOR USE IN EXCAVATOR FOR LAYING PIPELINES UNDERGROUND

Juichi Asano; Yasuo Okubo, both of Chigasaki; Hiroshi Saito, Isehara, and Shigeru Harada, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

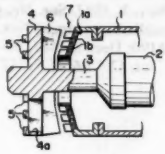
Filed Jan. 25, 1984, Ser. No. 573,888

Int. Cl.⁴ B02C *18/16*

U.S. Cl. 241—89.3 **5 Claims**

1. A pebble-stone crushing device for use in an excavator for laying pipeline underground comprising an excavator body having an annular front face plate, a cutter head mounted in front of said excavator body and said front face plate for exca-

vating a working face in front of said body and said cutter head, a plurality of rotor teeth formed integrally with the rear face of said cutter head and a plurality of stator teeth formed



radially on and integrally with said front face plate of said excavator body and facing said rotor teeth, said stator teeth comprising plural groups of radially spaced apart tooth members having different length.

4,555,065

CHOPPING ARRANGEMENT

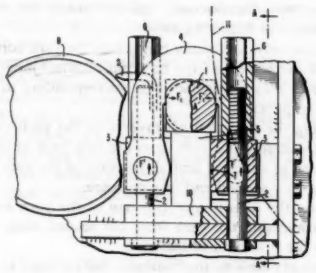
Berthold Binder, and Josef Pürrer, both of Gottmadingen, Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz AG, Gottmadingen, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,347

Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318752

Int. Cl.⁴ B02C *18/16*

U.S. Cl. 241—241 **2 Claims**



1. A chopping arrangement for a chopper, in particular a drum chopper having a chopping drum with several cutting blades spaced apart along its periphery which are attached to at least one rotating round anchor plate of the drum and cooperate with a counter blade having an adjustable position for chopping a stream of material fed between a gap between the cutting blades and counter blade, wherein the counter blade has longitudinal structure with mounting positions at each end, means clamping the counter blade at each said mounting position against a horizontally oriented stationary anvil with planar side walls, with an essentially U-shaped clamp clip which presses it against a horizontal surface of the anvil by means of tension screws fastened to the clamp clip and cooperating with tension adjusting nuts, extensions to the two arms of the clamp clip comprising articulation pieces having a convex side lying against the planar side walls of the anvil at only one point thereby to permit vertical displacement of one arm of the clamp clip by adjusting its nut to cause a corresponding, essentially horizontal displacement of the counter blade on said anvil to adjustably change the cutting gap between the blades.

4,555,066

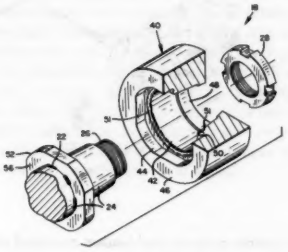
REPLACEABLE ROLL FOR ROLLER MILL

William D. Gibson, P.O. Box 345, Troutdale, Oreg. 97060, assignor to William D. Gibson, Portland, Oreg.

Continuation-in-part of Ser. No. 214,207, Dec. 8, 1980, abandoned. This application Jul. 12, 1983, Ser. No. 513,151

Int. Cl.⁴ B02C *15/08*

U.S. Cl. 241—293 **5 Claims**



1. A roll assembly for a roller mill comprising:

a generally cylindrical roll member having an axial bore,

the bore being defined by a central bore wall portion and a first bore end wall portion of greater radial dimension than said central bore wall portion so as to form an annular shoulder between said first bore end wall portion and said central bore wall portion, said first bore end wall portion intersecting an end face of said roll member to define a recess within said end face,

a generally annular end insert adapted for nonrotatable mounting within said recess and in abutment with said shoulder to positively engage said roll, said insert having an axial bore defined by a tapered bore wall,

a tapered shaft having a taper corresponding to the taper of the bore wall of said insert, said shaft being insertable through the axial bores of said roll member and said insert and into abutment with the bore wall of said insert to determine the position of the roll member along said shaft, said shaft terminating in a threaded end portion,

and a threaded nut member for threading on said threaded end portion and thereby forcing said roll member into secure abutment against said insert,

said annular shoulder comprising an annular tapered surface and said end insert including a mating annular tapered face in abutment against said tapered surface to provide lateral interference therebetween when said nut is threaded onto said threaded end portion and firmly against said roll member, thereby to restrain said roll member against lateral and axial movement relative to said insert.

4,555,067

TEXTILE DOFF SERVANT

Richard J. Angelucci, Springfield, Pa.; Andrew P. Cope, Wilmington, Del.; Donald E. Hallam, Wilmington, Del., and Harry E. Ladd, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 24, 1984, Ser. No. 613,648

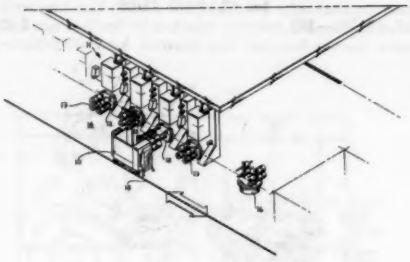
Int. Cl.⁴ B65H *54/20, 54/26, 67/06*

U.S. Cl. 242—35.5 A **2 Claims**

1. In a winding apparatus having a plurality of windups, each windup being located on one side of a service aisle and including a rotatable chuck and a push-off device mounted to the windup for moving yarn packages from the chuck, an apparatus for receiving yarn packages from the chucks as they are doffed from the windups by said push-off devices and delivering said packages to an unload station, said apparatus comprising:

(a) a carriage mounted for movement into a spaced relationship on the other side of the service aisle opposite a respective windup;

(b) means to align said carriage with a respective windup;
(c) an extendable and retractable frame mounted to said carriage, said frame having rods attached thereto, said rods being directed into alignment with the chucks of said respective windup when said frame is extended;



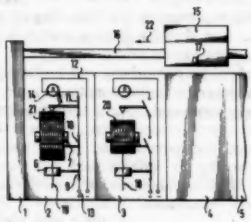
(d) a retractable push-off mechanism mounted on said frame and associated with said rods; and
(e) means for extending and retracting said frame across said service aisle toward and away from said respective windup.

4,555,068

METHOD FOR CALLING A BOBBIN-CHANGING DEVICE

Heinz Kamp, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 587,941
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308454
Int. Cl.⁴ B65H *63/00*
U.S. Cl. 242—36 **3 Claims**



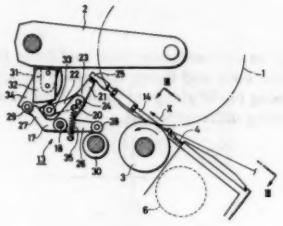
1. Method for calling a travelling bobbin-changing device to a winding station of a bobbin winding machine, each winding station having a thread presence monitor for monitoring the presence of a thread, a bobbin-stoppage indicator for indicating stoppage of rotation of the bobbin, and a bobbin filling indicator for indicating a predetermined fullness of the bobbin, which comprises continuously checking for the presence of a thread connected to the bobbin with the thread presence monitor, continuously checking for a stoppage of the rotation of the bobbin with the bobbin-stoppage indicator, continuously checking for the predetermined fullness of the bobbin with the bobbin filling indicator, issuing a signal when simultaneously the thread is present, the rotation of the bobbin has stopped and the predetermined fullness of the bobbin has been reached, and stopping the bobbin-changing device at the winding station for exchanging the bobbin with an empty bobbin tube when the signal is issued.

4,555,069

YARN WINDING APPARATUS AND METHOD

Yoshiyasu Maeda, Nara; Akira Ueura; Kazuyoshi Sato, both of Kyoto, and Katsunori Watanabe, Shiga, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Nov. 1, 1982, Ser. No. 438,414
Claims priority, application Japan, Nov. 2, 1981, 56-175896; Nov. 2, 1981, 56-176190; Dec. 2, 1981, 56-194789
Int. Cl.⁴ B65H *54/32*
U.S. Cl. 242—43 R **11 Claims**



1. A method of winding a yarn on a package, comprising the steps of:
(a) taking out a loose end of a yarn from a yarn supply and fixing the loose end to an empty package, the empty package having a width along an axis of rotation, thereafter maintaining a substantially uniform tension on the yarn throughout the subsequent steps;
(b) rotating the package about its axis of rotation so as to wind the yarn therearound, and continuing the rotation throughout the following steps:
(c) simultaneously, uniformly traversing the yarn across the width of the package from its point of attachment to the package to a first traverse limit corresponding to a first end of the package;
(d) reversing the direction of traverse of the yarn and uniformly traversing the yarn from the first limit of traverse of the yarn to a second limit of traverse of the yarn corresponding to a second end of a package;
(e) reversing the direction of traverse of the yarn and uniformly traversing the yarn from the second limit of traverse to the first limit of traverse;
(f) continuously sensing the radius of the package to establish when a full package has been formed, and when a full package is sensed, proceeding to step (j);
(g) progressively reducing the first and the second limits of traverse of the yarn so as to produce tapering ends on the package;
(h) repetitively performing steps (d) through (g) while further reducing the extent of traverse of the yarn by a creeping ratio, α, defined by:

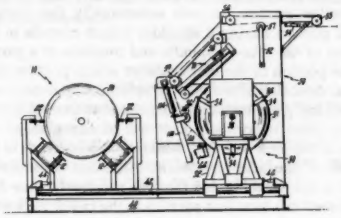
$$\alpha = t/(T+t)$$

where t is a time during which the traverse of the yarn is reduced to be less than the extent between the first and second traverse limits, and where T is a time during which the traverse of the yarn is at its full extent between the first and the second traverse limits, the creeping ratio being initially established to be significantly less than 1.0;
(i) progressively increasing the creeping ratio α to asymptotically approach 1.0 as the winding process proceeds; and
(j) stopping the winding on reaching a condition of a fully wound package, removing the fully wound package, and introducing a fresh empty package.

4,555,070
METHOD AND APPARATUS FOR UNWINDING AND SPLICING SUCCESSIVE ROLLS

Christopher Pali, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Jun. 4, 1984, Ser. No. 617,292
Int. Cl.[4] B65H *19/12, 19/18*
U.S. Cl. 242—58.1 15 Claims



1. A roll payoff unit for unwinding rolls of ribbon material having a central annular core and an outside diameter which comprises:

a retractable core chuck upon which the roll of material is mounted, said chuck having a first position wherein the roll is secured through the core and a second position wherein the chuck is retracted releasing the roll;

a drive belt assembly including an endless drive belt engaging the exterior surface of the roll, said assembly being pivotally mounted to continuously engage the outside diameter of the roll as the roll diameter decreases during unwinding of the roll;

pulley means for guiding the ribbon being unwound from the roll;

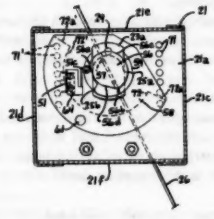
dancer means connected to the ribbon to sense and control ribbon tension by regulating the speed of the endless drive belt; and

a paster arm assembly for use in joining the trail end of the ribbon from a consumed roll to the beginnng end of the ribbon from a new roll including means for clamping the ribbon and means for cutting the ribbon, said assembly being mounted to pivot between several positions including a cutting position in registration with the ribbon when the roll is almost completely consumed and an unwinding position not in registration with the ribbon.

4,555,071
STOCK REEL DANCER

Richard D. Nordlof, 3312 Crest Rd., Rockford, Ill. 61107

Filed Oct. 30, 1984, Ser. No. 666,502
Int. Cl.[4] B65H *75/02, 59/38*
U.S. Cl. 242—75.5 11 Claims

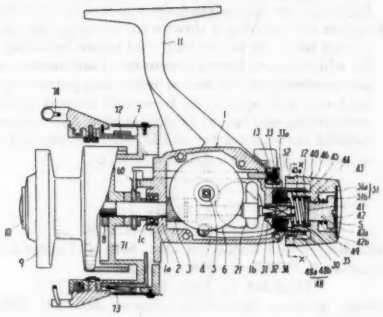


1. A stock reel comprising, a reel support, stock reel means for mounting a coil of stock on the reel support for rotation about a generally horizontal axis, an electric reel drive motor for driving the stock reel, a dancer arm mounted on the reel support for swinging movement about a generally horizontal dancer arm axis, the dancer arm being adapted to engage a loop of stock extending from the stock coil to be angularly displaced thereby through a range of dancer arm positions as the loop of stock increases and decreases, motor control means connected to said reel drive motor and having an input signal controller, said motor control means being operated to actuate the reel drive motor in response to a preselected input signal from the input controller, rotary actuator means for said input signal controller operative to control the input signal produced by the input controller in accordance with the relative angular position of the input controller and the rotary actuator means, means mounting said rotary actuator means for turning with said dancer arm about the dancer arm axis through said range of dancer arm positions, means mounting said input signal controller on said reel support for angular adjustment relative to the reel support about the dancer arm axis to vary the angular position of the dancer arm at which said input signal controller produces said preselected input signal.

4,555,072
DRAG MECHANISM FOR A SPINNING REEL

Yasuhiro Hitomi, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 6, 1984, Ser. No. 586,717
Claims priority, application Japan, Mar. 10, 1983, 58-35034
Int. Cl.[4] A01K *89/01, 89/02*
U.S. Cl. 242—84.5 R 6 Claims



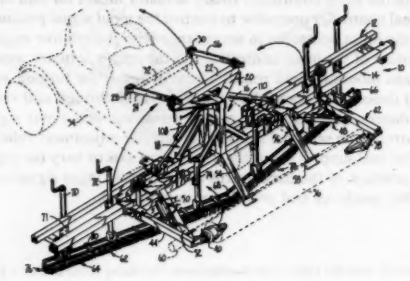
1. A drag mechanism for a spinning reel comprising a reel body, a spool and a spool shaft rotatable and movable longitudinally of said reel body, said drag mechanism for applying a resistance against rotation of said spool shaft and comprising: at least one first friction plate supported non-rotatably to said spool shaft, at least one second friction plate disposed adjacent to said first friction plate and supported non-rotatably to said reel body, an adjusting knob screwed with said reel body such that said adjusting knob is rotatable relative to said reel body, a drag spring, a restriction means for restricting a range of rotation of said adjusting knob with respect to said reel body, said adjusting knob including a spring holder for holding said drag spring, said drag spring being interposed between said first and second friction plates and an initial load adjuster, said initial load adjuster being movable toward or away from said friction plates to adjust an initial rotational resistance load applied against rotation of said spool shaft by said adjusting knob, said initial load adjuster including a display means for displaying an indication of said initial load set by said initial load adjuster.

4,555,073

APPARATUS FOR LAYING PAVING FABRIC

Mounque Barazone, 22141 Buckeye Pl., Cottonwood, Calif. 96022

Filed Sep. 6, 1983, Ser. No. 529,627
Int. Cl.[4] E01C *19/48*
U.S. Cl. 242—86.5 R 10 Claims



1. A vehicle mounted apparatus for laying paving fabric from a roll on a surface comprising:

a. a first, member having a lateral dimension;

b. a second member having a lateral dimension said second member being transversely spaced and distinct from said first member, said first and second members being capable of connection to the vehicle for movement therewith;

c. means for supporting the roll from said second member, for permitting the roll to unwind with vehicle movement and for laying the fabric over the surface, said means for supporting the roll from said second member including at least one arm appending from said second member;

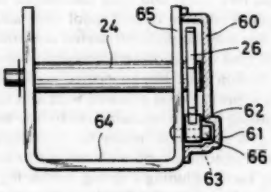
d. means for applying a downward force on the unwound paving fabric on the surface; said means including means for adjusting said lateral dimension of said second member independently of said first member, thus permitting said at least one arm appending from said second member to move along said lateral dimension of said second member without impediment by said at least one element of said means for applying a downward force.

4,555,074

WEBBING RETRACTOR

Osamu Kawai, and Katsuyasu Ono, both of Fujisawa, Japan, assignors to NSK-Warner K.K., Japan

Filed Jul. 12, 1983, Ser. No. 513,071
Claims priority, application Japan, Jul. 19, 1982, 57-108999[U]
Int. Cl.[4] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A 3 Claims



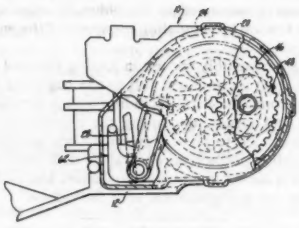
1. A webbing retractor comprising a casing equipped with a pair of side plates, a take-up spindle rotatably supported by the side plates and having a webbing fastened to the take-up spindle at one end thereof, a cog wheel provided outside one of the side plates in such a way that it is allowed to rotate together with the take-up spindle, a lock member having a portion extending in the axial direction of the take-up spindle and supported by at least one of the side plates in such a manner that the lock member is displaceable between a first position where the lock member is kept in engagement with the cog wheel and a second position where the lock member is out of engagement with the cog wheel, an auxiliary plate having a radially extending substantially flat surface disposed outside the cog wheel substantially as an integral unit with the one of the side plates said plate including an axially outwardly extending swollen portion on said substantially flat surface, said swollen portion having a shoulder which extends in the axial direction of the take-up spindle and overlaps at a part thereof with the portion of the lock member which portion extends in the axial direction of the take-up spindle, and means mounting the auxiliary plate in such a manner that the shoulder of the auxiliary plate is normally kept out of engagement with the portion of the lock member, which portion extends in the axial direction of the take-up spindle, but when a tensile force is applied to the webbing and the lock member is thus deformed or displaced in a direction parallel to the radial direction of the take-up spindle, the portion of the lock member which portion extends in the axial direction of the take-up spindle is thereby correspondingly brought into contact and engagement with the shoulder of the auxiliary plate whereby to support the lock member.

4,555,075

DUAL MODE SEAT BELT RETRACTOR ASSEMBLY

Timothy J. Schmidt, Troy, and Ronald A. Heintzleman, Sterling Heights, both of Mich., assignors to General Safety Corporation, St. Clair Shores, Mich.

Filed Mar. 13, 1985, Ser. No. 711,319
Int. Cl.[4] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A 10 Claims



1. A seat belt retractor which may be operated either as an emergency locking retractor which prevents seat belt webbing from being withdrawn when said retractor is subjected to deceleration above a predetermined level, or as an automatic locking retractor which acts to retract said webbing but inhibits webbing withdrawal, comprising;

a retractor frame,

a spool rotatably attached to said frame for winding said webbing, said spool having at least one toothed sprocket,

a locking bar mounted to said frame and movable between a position of engagement with said toothed sprocket thereby inhibiting withdrawal of said webbing to a position of disengagement with said toothed sprocket thereby permitting withdrawal of said webbing,

an inertia sensitive actuator acting upon said locking bar in response to a deceleration level above a predetermined threshold,

an actuator cam rotatable with said sprocket, said actuator cam defining a plurality of teeth extending generally radially with respect to the axis of rotation of said sprocket,

an actuator lever having a pair of arms, a first arm engageable with said locking bar and a second arm engageable with said actuator cam teeth, and

means for moving said actuator lever between a position

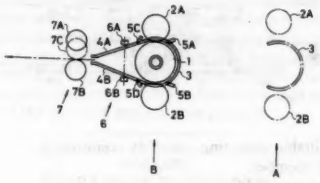
wherein said second arm is disengaged with said cam teeth causing said first arm to be disengaged from said locking bar whereby said retractor functions as an emergency locking retractor, to a position wherein said second arm is engaged with said cam teeth, said cam teeth acting on said second arm, causing said first arm to engage with said locking bar and urge said locking bar into engagement with said toothed sprocket when said webbing is withdrawn whereby said retractor functions as an automatic locking retractor.

4,555,076

FILM HANDLING DEVICE

Kaoru Uchiyama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 10, 1984, Ser. No. 629,399
Claims priority, application Japan, Jul. 11, 1983, 58-126323
Int. Cl.⁴ G03B *1/04*; G11B *15/32*
U.S. Cl. 242—195 **4 Claims**



1. In a film handling device which comprises rotatable holding means for receiving and holding a film removed from a film cartridge thereof, guide members for guiding said film while being forwarded, and air flow supplying means for urging said film in a film forwarding direction to forward said film beginning at a front end portion thereof, the improvement wherein: said holding means is made rotatable in both a film winding and said film forwarding directions, and film retaining means movable into and out of engagement with said film held by said holding means and detecting means for detecting when a chance for forwarding said film held by said holding means occurs said holding means turning in said film winding direction when said film is retained by said film retaining means and turning in said film forwarding direction when said detecting means detects said front end portion of said film.

4,555,077

TAPE CARTRIDGE

Sanford Platter, Boulder; Charles A. Durand, Aurora, and Larry R. Gadsby, Littleton, all of Colo., assignors to Electronic Processors, Inc., Englewood, Colo.

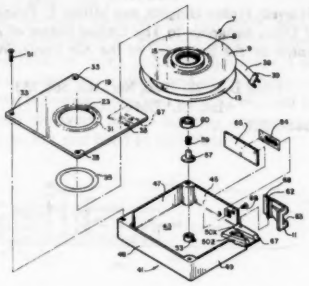
Filed Nov. 25, 1983, Ser. No. 554,929
Int. Cl.⁴ G03B *1/04*; G11B *15/32*
U.S. Cl. 242—198 **2 Claims**

1. A single reel magnetic tape system including in combination:

a cartridge, said cartridge having at least a first and second opposed base, side walls connected between said bases and defining an opening, and a door, said door being mounted at said opening defined by said side walls in a manner which allows it to close said opening or to be swung away from said opening;

a reel, said reel having a first and second spaced apart flange connected by a circular winding hub, one said flange carrying clutch means located on its external surface concentric to said hub;

a floating shaft mounted on one of said cartridge bases to support said reel for rotation of said reel around said shaft; substantially circular clutch means on said other base said circular clutch means located in stacked registration with said clutch means carried by said reel flange; and



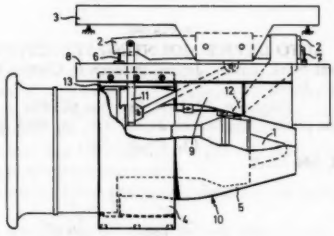
means for biasing said clutch means carried by said reel flange and by said base into engagement with one another to prevent rotation of said reel within said cartridge.

4,555,078

APPARATUS FOR THE SUSPENSION OF AN AIRCRAFT ENGINE COWLING

Léon L. Grognard, Wezembeek-Oppem., Belgium, assignor to Société Belge d'Exploitation de la Navigation Aérienne (SABENA), Brussels, Belgium

Filed Dec. 27, 1983, Ser. No. 565,581
Int. Cl.⁴ B64D *27/00*
U.S. Cl. 244—54 **10 Claims**



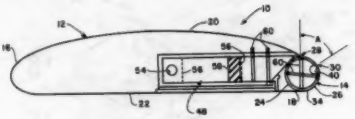
1. An apparatus for the suspension of an aircraft turbo-fan engine cowling to a supporting structure, said cowling including a fan duct and a core cowl, the apparatus comprising a flexmount member to be attached to the supporting structure and a pylon, said pylon including an upper pylon element suspended to the flexmount member and a lower pylon element, the lower pylon element having attachment means; a suspension device arranged in the upper pylon element and having first hook means arranged to cooperate with said attachment means on the lower pylon element, and second hook means for suspension of the fan duct, said suspension device having a first operating state in which said first hook means are coupled with said attachment means on the lower pylon element thereby to suspend the lower pylon element to the upper pylon element and a second operating state in which said first and second hook means are disengaged from the corresponding attachment means; locking means arranged when it is operated, to lock the lower pylon element to the core cowl; and drive means to actuate the suspension device and the locking means from one operating position to the other.

4,555,079

MULTIPLE JET BLOWING AROUND THE BLUNT TRAILING EDGE OF A CIRCULATION CONTROLLED AIRFOIL

John K. Harvell, Huber Heights, and Milton E. Franke, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 28, 1983, Ser. No. 566,753
Int. Cl.[4] B64C *21/04*
U.S. Cl. 244—207 **5 Claims**



1. In a circulation controlled airfoil including a body structure and an elongated cylindrical member, said body structure having leading and trailing ends with an upper suction surface and a lower pressure surface extending between said ends, said cylindrical member being disposed along said trailing end of said body structure between said upper and lower surfaces thereof and having an outer cylindrical surface which provides a rounded, blunt trailing edge surface, the improvement which comprises:

a. said outer surface of said cylindrical member and said trailing end of said body structure adjacent said upper surface defining a first elongated blowing jet slot;

b. said cylindrical member including a tubular wall having a second elongated blowing jet slot defined therein; and

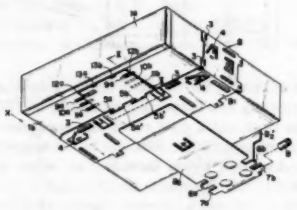
c. said cylindrical member being rotatable relative to said trailing end of said body structure whereby the distance between said first and second jet slots is selectable to optimize lift generation for said airfoil at a predetermined flight condition.

4,555,080

AUTO DEVICE MOUNTING STRUCTURE

Hirotoshi Nara, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,589
Claims priority, application Japan, Apr. 28, 1983, 58-63134
Int. Cl.[3] G12B *9/00*
U.S. Cl. 248—27.1 **7 Claims**



1. An auto device mounting structure for mounting an auto device in position in a car, comprising:

bracket means having a caliber corresponding to the outer dimension of said auto device;

a plurality of grooves formed in an outer case of said auto device, said grooves being elongated in a direction transverse to a direction of insertion of said auto device into said bracket means and said grooves being spaced in said direction of insertion;

at least one cut formed in said bracket means; and

a slide plate having at least one engagement claw engageable with any selected one of said grooves and having at least one fixture claw engageable with said cut;

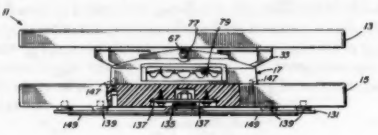
wherein said bracket means includes a sleeve-shaped bracket member and a rear frame which is connected to and extends coplanarly and rearwardly from said bracket member, said rear frame terminating at an end plate and having one or more tongues thereon which are frontwardly spaced from said end plate and can contact a back face of said auto device when bent vertically.

4,555,081

TILTABLE AND SWIVABLE MOUNTING ASSEMBLY FOR A VIDEO DISPLAY TERMINAL

Albert G. Ermanski, Auburn, Mass., assignor to Wright Line, Inc., Worcester, Mass.

Filed Oct. 19, 1982, Ser. No. 435,571
Int. Cl.[4] F16M *11/12*
U.S. Cl. 248—183 **17 Claims**



15. A tiltable mounting assembly comprising:

a. a top member,

b. a base assembly,

c. an intermediate assembly disposed between said top member and said base assembly,

d. said intermediate assembly including:

i. a bridge housing,

ii. a first rocker seated on said bridge housing for rocking movement relative to said bridge housing and fixedly attached to said top member, and

iii. a second rocker seated on said bridge housing for rocking movement relative to said bridge housing and fixedly attached to said top member, and

e. means for rocking said first rocker relative to the bridge housing whereby said rocking will cause tilting movement of said top member relative to said base assembly, said means for rocking comprising a lever arm coupled to said first rocker and to said bridge housing, and rotatable means including a thumbwheel coupled to said lever arm and adapted and configured so that rotation thereof will cause a movement of said lever arm and thereby rocking of said first rocker.

4,555,082

SHELF ASSEMBLY AND A SUPPORT BRACKET FOR USE THEREIN

Michael C. Sack, 400 E. 71st St., Apt. 5E, New York, N.Y. 10021; Donald E. Henson, Dearborn Heights, and Russell M. Sack, Sterling Heights, both of Mich., assignors to Michael C. Sack, New York, N.Y.

Filed May 21, 1984, Ser. No. 612,476
Int. Cl.[4] A47B *5/00*
U.S. Cl. 248—220.1 **13 Claims**

1. An integrally molded plastic corner shelf support bracket consisting essentially of:

(a) a left wing having at least one means for connection to a first wall;

(b) a right wing having at least one means for connection to a second wall;

(c) a hinge portion integrally connecting the left and right wings together and permitting relative flexing movement of said wings in a plane extending therebetween;

(d) a left cross brace member

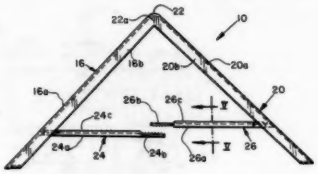
(i) integrally connected to the left wing and extending

therefrom toward the right wing and flexibly moveable in the plane extending between the wings, and

(ii) including a first serrated section having a plurality of triangular shaped teeth; and

(e) a right cross brace member

(i) integrally connected to the right wing and extending therefrom toward the left wing and also flexibly moveable in the plane extending between the wings, and



(ii) including a second serrated section having a plurality of triangular shaped teeth overlapping the first serrated section whereby the cross brace members may be flexed in said plane to force the left and right wings into pressure engagement with the first and second walls, and the serrated sections may be pressed together in cooperative engaging relationship to hold the wings temporarily in the pressure engagement position.

4,555,083

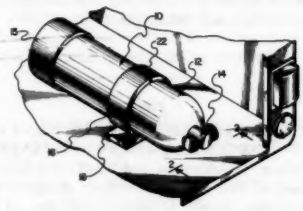
SCUBA TANK POSITIONER

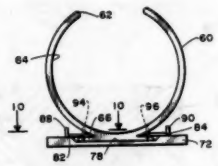
Frank D. Carter, 23 N. Ellis Pl., Newbury Park, Calif. 91320

Continuation-in-part of Ser. No. 445,159, Nov. 29, 1982, abandoned. This application Jun. 21, 1984, Ser. No. 622,981

Int. Cl.⁴ B60P *7/12;* **A47G** *23/02*

U.S. Cl. 248—313 **4 Claims**





1. In combination with a scuba tank, said scuba tank having a substantially cylindrical wall, a scuba tank positioner for preventing rolling movement of said scuba tank, said positioner comprising:

a ring shaped band formed of a rigid material defining an interior area, said ring shaped band including expanding means for varying the size of said interior area, said expanding means comprising a slit formed within said band extending the entire width through said band;

a substantially planar supporting plate, said plate being constructed of sheet material, said plate having a length and a width, said band being attached by connecting means to said plate, said connecting means comprising a dovetail slot assembly, said band being removable and separable from said plate; and

a latching assembly mounted on said plate, said latching assembly comprising at least one latching member, said latching member being pivotally movable on said plate between a latching position and an unlatching position, said band including a pin, said latching member to engage with said pin when in said latching position to thereby fixedly secure said band to said plate.

4,555,084

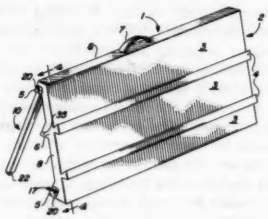
BINGO CARD SUPPORT

Clifford E. Anderson, 1610 Alabama St.; Clarence E. Simon, 3606 Dick Taylor St., both of Monroe, La. 71202, and Phillip E. Barnes, 104 High Cir., West Monroe, La. 71291

Filed Mar. 2, 1984, Ser. No. 585,922

Int. Cl.⁴ A47G *1/24;* **A47B** *97/08, 85/06;* **A63F** *3/06*

U.S. Cl. 248—460 **10 Claims**



1. A bingo card support comprising:

(a) a substantially flat frame surface, a border extending aroung the periphery of said frame surface and leg flanges extending from said border;

(b) at least four legs adjustably and removably carried by said leg flanges in spaced relationship;

(c) three slots provided in spaced relationship in said frame surface;

(d) spring biased boards carried by said slots in said frame surface; and

(e) spring means in association with said spring biased boards, whereby said spring biased boards are normally biased against said frame surface.

5. A Bingo card support comprising:

(a) a support frame having a substantially flat frame surface and a border extending around the periphery of said frame surface;

(b) at least four leg flanges extending from said border in spaced relationship and four primary legs adjustably carried by said leg flanges;

(c) a pair of dovetail strips attached to said frame surface in spaced relationship; and

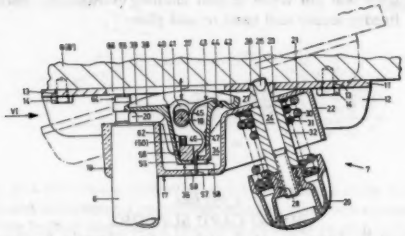
(d) a top guide carried by each of said leg flanges, a middle guide carried by each of said leg flanges in spaced relationship with respect to said top guide and a bottom guide carried by each of said leg flanges in spaced relationship with respect to said middle guide, whereby said legs are selectively positioned between said top guide and said middle guide and between said middle guide and said bottom guide, respectively.

4,555,085

LOCKABLE TILTING APPARATUS FOR CHAIR SEATS

Fritz Bauer, Schulzstrasse14, D-8503 Altdorf; Hans-Peter Bauer, Altdorf, and Hans Jürgen Bauer, Altdorf-Röthenbach, all of Fed. Rep. of Germany, assignors to Fritz Bauer and Söhne oHG, both of Altdorf, Fed. Rep. of Germany

Filed Nov. 16, 1982, Ser. No. 442,190
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—561 20 Claims



1. A lockable tilting apparatus for the seats of chairs, said apparatus comprising a base plate securable to a chair seat, said tilting apparatus comprising a stationary body member adapted to be supported by the pedestal of the chair, spring means supported by said stationary body member, means supported by said stationary body member mounting said base plate for tilting pivotal movement relative to said stationary body member, link means engaging and movable with said base plate against the restoring force of said spring means whereby said base plate is tiltably movable relative to said body member against the restoring force of said spring means; and wherein a locking appratus which is actuatable by displacement of an operating lever between two terminal positions is provided for selectively locking the base plate against tilting movement or for releasing the base plate for tilting movement, characterized by a slide member mounted in said body member for sliding movement relative to said base plate, said slide member being selectively movable between said two terminal positions, said slide member having receptacle means, said operating lever engaging said receptacle means, and defining means for selectively moving said slide member between said two terminal positions, said receptacle means being accessible for engagement by said operating lever from either of two laterally opposite sides of said body member,

said body member being operatively connected to the body of said chair via a longitudinally adjustable gas spring, said operating lever being pivotably disposed in said body member for operating said longitudinally adjustable gas spring, and said slide member being displaceable by means of axial displacement of said operating lever.

4,555,086

PLASTIC MOLDING APPARATUS

Tsutomu Kiyotomo, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 10, 1984, Ser. No. 569,602
Claims priority, application Japan, Jan. 13, 1983, 58-3823
Int. Cl.⁴ B29C *1/00, 7/00;* B29D *3/00;* B29F *1/14*
U.S. Cl. 249—67 7 Claims

1. A plastic molding apparatus for molding semiconductor elements on a frame, comprising:

upper and lower heater plates symmetrically disposed about said frame, said lower heater plate having a plurality of apertures extending substantially perpendicular to said frame;

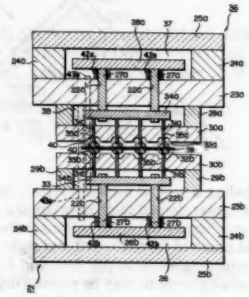
upper and lower molds mounted between said heater plates for movement therewith, said lower mold having bores and molding cavities, said bores being connected individually to each of said mold cavities;

first spacer means for rigidly connecting said upper heater plate to said upper mold;

second spacer means for rigidly connecting said lower heater plate to said lower mold;

lower support rods extending through and being individually slidable within said apertures of said lower heater plate;

a first lower ejector plate connected at one end of said rods and being movable therewith;



a second lower ejector plate detachably connected at an opposite end of said rods and being movable witih said first lower ejector plate;

lower ejector pins mounted on said second lower ejector plate and extending individually through each of said bores, said lower ejector pins and said lower support rods being movable together with said lower ejector plates; and

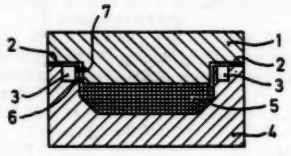
means for movably positioning said second lower ejector plate toward said heater plate.

4,555,087

SPLIT MOLD FOR MULTI-COMPONENT PLASTICS, ESPECIALLY POLYURETHANES

Josef Wallner, Holzkirchen, and Manfred Kelterbaum, Strasslach, both of Fed. Rep. of Germany, assignors to Elastogran Maschinenbau GmbH, Strasslach, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,713
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310677
Int. Cl.⁴ B29C *1/00;* B29G *1/00*
U.S. Cl. 249—78 4 Claims



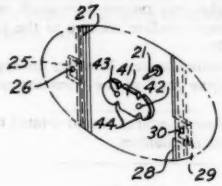
1. In a split mold for multi-component plastics, especialy polyurethanes which react within the mold and which reaction may be accelerated by the application of heat, the mold having venting channels, the improvement comprising: heating means located only immediately adjacent some or all of the said channels said heating means briefly heating said channels to a sufficiently high temperature to accelerate reaction of said plastics whereby to prevent entry of said plastics into said channels.

4,555,088

ARCHITECTURAL CONSTRUCTION AND EQUIPMENT FOR CONCRETE

Shih-Chieh Chang, 29-10, Ta-Pun Rd., Taichung, Taiwan

Division of Ser. No. 530,606, Sep. 9, 1983, abandoned. This application Sep. 24, 1984, Ser. No. 653,487
Int. Cl.[4] B28B 7/28
U.S. Cl. 249—192 **3 Claims**



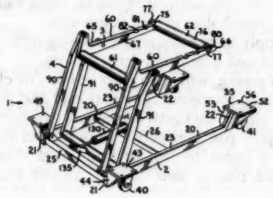
1. A reusable panel system for making concrete form structures comprising at least two adjacent panels, each of said panels having a facing for shaping the concrete material thereagainst and a one-piece extruded rib on two opposite side edges of the panel joined with said facing, one of the two ribs having a tongue projecting toward the adjacent panel and extending substantially the full length of the rib, the other rib having a groove therein extending substantially the full length of said other rib and extending into said rib from the direction of the adjacent panel whereby the tongue of one panel extends into the groove of the second panel when said panels are positioned adjacent and abutting each other, said tongues and said grooves each having at least two recesses extending thereinto in the plane of the panels and into said ribs, a connector for each pair of adjoining recesses in said ribs inserted into said panel recesses, each panel and each end of each connector having holes in alignment for reception of a pin in said aligned holes for maintaining said connectors in said recesses and for maintaining adjacent panels connected to each other.

4,555,089

WHEEL LIFT DEVICE

Leonard F. Eck, McPherson, Kans., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Mar. 12, 1984, Ser. No. 588,390
Int. Cl.[4] B60P 1/48
U.S. Cl. 254—10 B **5 Claims**



1. A wheel lift device for raising and lowering a vehicle by engagement with a vehicle wheel, said vehicle wheel having an outer rolling surface and opposite generally parallel sidewalls; said device comprising:

(a) a lower support frame having an open end and two substantially parallel support members;

(i) said support members laterally spaced and having a cross-member extending therebetween;

(ii) said lower support frame being movable and adapted to approach said wheel and receive a portion of said wheel therein with said support members extending on opposite sides of said wheel and generally parallel to the sidewalls of said wheel and with a portion of said rolling surface received within said open end;

(b) casters mounted on said lower support frame for movement of said wheel lift device over a floor surface;

(c) an upper generally rectangular carriage movable generally above said support frame;

(d) a lifting mechanism including support means extending between said support frame and said carriage;

(i) said support means including a first pair of links and a second pair of links;

(ii) said first and second pair of links pivotally connected to and extending between said support frame and said carriage;

(iii) said first and second pair of links forming a substantially parallelogram structure and maintaining said carriage substantially parallel to said support frame during said raising and lowering;

(e) longitudinal force means for selectively actuating raising and lowering of said carriage relative to said support frame;

(f) said rectangular carriage having two substantially parallel legs forming two sides thereof and laterally spaced for extending on opposite sides of said wheel and generally parallel to said sidewalls of said wheel when said wheel lift device is in use; said carriage having arm members extending between said legs, said arm members forming two opposing generally parallel sides of said rectangular carriage;

(i) said carriage engageable with said wheel outer rolling surface to cradle said wheel between said arm members and lift said vehicle;

(ii) said arm members including elongate rollers upon which said wheel rolling surface is supported during lifting of said vehicle;

(iii) said arm members being first and second arm members;

(g) gate means including said second arm member;

(i) said gate means permitting said carriage to approach said wheel while said vehicle is standing on said floor with a portion of said rolling surface entering said carriage and with said carriage legs straddling said wheel and extending on opposite sides thereof and generally parallel to said wheel sidewalls;

(ii) said gate means being closable to reform said generally rectangular carriage.

4,555,090

FENCE POST DRIVING AND PULLING APPARATUS

Wil W. Averhoff, Rte. 2, Box 309, Hwy. 171, South, Hubbard, Tex. 76648

Filed Sep. 23, 1983, Ser. No. 535,322
Int. Cl.[4] E21B 9/00
U.S. Cl. 254—29 R **9 Claims**

1. A device connectable to a vehicle for driving a fence post comprising:

a frame;

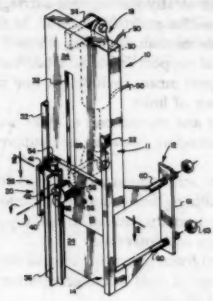
a track formed on said frame by an I-beam having a web and flanges, said web having a vertical slot therein;

means for mounting said frame to said vehicle;

a substantially planar slide mounted adjacent said web of the track and slidably engaged on either side by the flanges of said track;

a traveling cylinder mount projecting from said traveling slide and passing through said slot;

a fixed cylinder mount connected to said frame;



a hydraulic cylinder connected to said frame; and

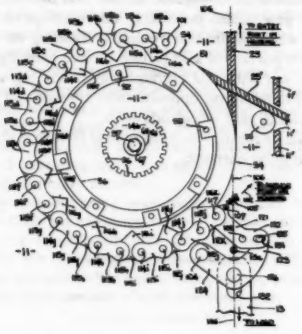
means for selectively securing said fence post to said traveling slide.

4,555,091

EFFICIENT LIGHTWEIGHT HOIST WITH MULTIPLE-CABLE-SIZE TRACTION AND SAFETY SYSTEMS

Marvin M. May; Robert C. Billings, both of Los Angeles; Harry A. Kendall, Granada Hills, and Jeffrey T. Bayorgeon, Walnut, all of Calif., assignors to Power Climber, Inc., Los Angeles, Calif.

Filed Jun. 23, 1983, Ser. No. 508,074
Int. Cl.[4] B66D *5/18, 5/20;* **F16H** *1/28*
U.S. Cl. 254—267 **10 Claims**



1. An efficient, lightweight power transmission system for a hoist that is particularly adapted for raising and lowering cable-suspended scaffolds and the like and that has a housing, such housing comprising two generally parallel walls each having defined in it an aperture to snugly receive one respective section of an output drive shaft of the transmission system; said system comprising:

a speed-reducing power transmission mechanism having:

a transmission-mechanism case that has two sides disposed between such two walls of the housing,

an input drive shaft rotatably mounted in the transmission-mechanism case,

mechanical means, within the case, connected to receive torque from the input drive shaft and to produce torque with an increased mechanical advantage and reduced speed,

an output drive shaft, connected to receive said torque with increased mechanical advantage and reduced speed from the said mechanical means, and which when driven rotates relative to the case,

the output drive shaft being secured to such hoist housing so that in use the case rotates relative to such hoist housing, and the output drive shaft being effectively split in two sections, one extending axially outward from the transmission-mechanism case at each side thereof, and

only one of the two output-drive-shaft sections being secured against rotation relative to the corresponding housing wall;

drive means, mounted to such housing, for applying torque to the input drive shaft of the transmission mechanism; and

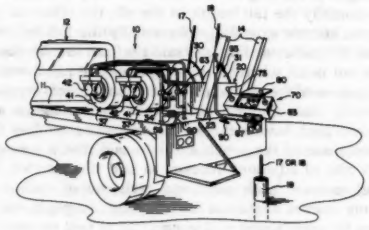
a cable-driving sheave secured to and rotated by the case of the transmission mechanism.

4,555,092

SYSTEM FOR OPERATION OF A DIRECT DRIVE DUAL DRUM WINCH

Mark Overholt, 6867 Wooster Pike, Medina, Ohio 44256

Filed May 27, 1983, Ser. No. 498,787
Int. Cl.[4] B66D *1/08*
U.S. Cl. 254—291 **5 Claims**



1. A system for operation and use of a dual drum line and cable winch mounted for use as a mobile well tending rig, each said drum being driven by a direct connected hydraulically powered motor, said system comprising:

a variable displacement, axial piston, reversing swashplate hydraulic pump unit powered by an engine;

a first actuator for controlling the horse power transmitted from said engine to said pump unit;

a second actuator for controlling the tilt angle and tilt direction of the swashplate in said pump unit;

dual fluid supply or exhaust piping running from said pump unit toward said dual drum drive motors;

a network of piping, with two pairs of open or closed fluid control valves, communicating with said dual fluid supply or exhaust piping, said network having two pairs of pipes, each said pipe pair connecting both of said fluid supply and exhaust pipes to one of said drum drive motors through one pair of said open or closed fluid control valves;

two-position control means for actuating all of said open or closed network control valves in unison so that as said pair of control valves in one said pipe pair are being opened, said pair of control valves in the other said pipe pair are being closed, or vice versa;

said dual fluid supply or exhaust piping being cross-connected through a lateral pipe section before reaching said two network pairs of pipes, said lateral pipe section having an open or closed fluid control valve, there also being a two-position control means for opening or closing said lateral pipe section control valve;

a first remote control means for said first actuator and a second remote control means for said second actuator;

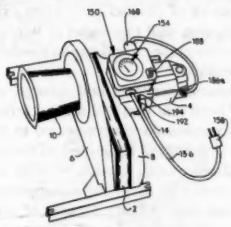
whereby, a user of said system can select either of said drum drive motors to be powered by movement of said two-position control means for all of said network control valves in unison, can also control the direction of rotation for the selected drum drive motor by said second remote control means, can also control the power output from the selected drum drive motor by said first remote control means, and can also free fall the drum connected to the selected drum drive motor by movement of said two-position control means for opening or closing said lateral pipe section control valve.

4,555,093

CABLE PULLING DEVICE WITH FORCE INDICATOR AND OVERLOAD PROTECTION

Jeffrey J. Plummer, Rockford, Ill., assignor to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 435,172, Oct. 19, 1982, abandoned. This application Aug. 21, 1984, Ser. No. 642,916
Int. Cl.[4] B66D *1/12, 3/16, 3/20*
U.S. Cl. 254—362 2 Claims



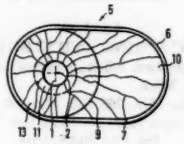
1. A cable pulling device comprising a support frame, a capstan means rotatably mounted on the support frame, driving means for rotating the capstan means to exert a cable pulling force, said driving means including an electric motor means mounted on the support frame and a control unit connected in the hot line to the electric motor means for monitoring the cable pulling force and interrupting power to the electric motor when cable pulling force approaches an overload level where damage could occur to the cable pulling device, said control unit including a control box, an ammeter means on the control box calibrated to visually display cable pulling force in response to a given amperage drawn by said motor, circuit breaker means on the control box for automatically interrupting power to said motor when overload is approached and on-off switch means on the control box for manually interrupting power to said motor means and for resetting said circuit breaker means in the event it is actuated by overloading pulling forces, and a pair of spaced apart flanges on the control box spaced sufficiently to supportingly straddle the electric motor means including chain means having one end fixedly connected to one flange and another end removably connected to the other flange with the chain means extending around the electric motor between said flanges for releasably and rotatably mounting the control box on the electric motor means so that an operator can detach and move the control box for monitoring and controlling the cable pulling device close to the operator when said operator is remote from the cable pulling device and so that the operator can adjust viewing angle of said control unit when it is mounted on the cable pulling device.

4,555,094

PROCESS FOR THE REPAIR OF SLIDE PLATES

Egon Evertz, Vorlander Strasse, 5650 Solingen, and Jorg Pirdzun, Mulheim, both of Fed. Rep. of Germany, assignors to Egon Evertz, Solingen, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,854
Int. Cl.[4] C21C *5/46*
U.S. Cl. 266—45 10 Claims



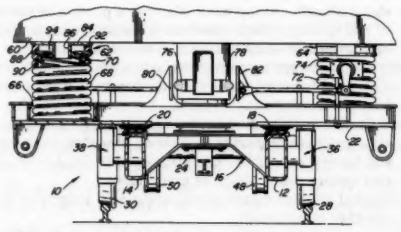
1. A method for repairing lower and upper slide plates of closures in metallurgical containers, in particular in casting ladles and intermediate containers for continuous casting, the slide plate able to release a stream of liquid metal by means of a passage opening or interrupting it by means of a closed section, according to its position, and undergoing damage, in particular erosion and radial cracks, originating at its passage opening, in which method a bore is made in the area of the opening of the slide plate concentrically with respect to its passage opening, and when the passage opening is released, a refractory casting mass is poured directly without intervening materials into the bore and is solidified therein, wherein the bore, which is concentric with respect to the passage opening, as far as the edge of the rim of the slide plate, and wherein the grain sizes of the solid bodies of the refractory casting mass are predominantly smaller than the average cross-sectional pore sizes of the retained refractory material of the slide plate.

4,555,095

ISOLATOR FOR A SPRING IN A RAILWAY CAR

William W. Dickhart, III, Ft. Washington, Pa.; Dante J. Graziani, Jr., W. Berlin, N.J.; James M. Herring, Jr., Merion Station; Michael J. Pavlick, Norristown, both of Pa., and Edward J. Renn, Churchville, Pa., assignors to The Budd Company, Troy, Mich.

Filed Mar. 12, 1984, Ser. No. 588,617
Int. Cl.[4] F16F *1/12*
U.S. Cl. 267—4 5 Claims



1. In combination with a vertical mechanical spring mounted to a railway truck for supporting a car body,

mounting means disposed on one end of said spring comprising:

(a) top and bottom plates spaced to receive an elastomeric ring therebetween;

(b) spaced cylindrical pieces attached to said top and bottom plates to receive an elastomeric ring therebetween;

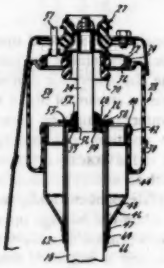
(c) said cylindrical pieces with said second elastomeric ring extending into said vertical mechanical spring;
(d) a first elastomeric ring connected between said top and bottom plates to provide vertical compliance between said spring and said car body; and
(e) a second elastomeric ring connected between said spaced cylindrical pieces to provide lateral compliance between said spring and said car body.

4,555,096

PNEUMATIC SPRING AND STRUT ASSEMBLY

Marc I. Pryor, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 208,765, Nov. 20, 1980, abandoned. This application Nov. 18, 1983, Ser. No. 553,412
Int. Cl.⁴ F16F *9/04*
U.S. Cl. 267—8 R **6 Claims**



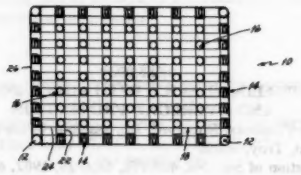
1. A hydraulic suspension strut for a motor vehicle having sprung and unsprung telescopically related hydraulic shock absorber components,
said sprung shock absorber component being constructed to be connected to a sprung vehicle structure;
said unsprung shock absorber component being constructed to be connected to a support structure for supporting a steerable road wheel that is adapted to be angularly displaceable about a generally verticle steering axis;
said unsprung shock absorber component being angularly displaceable relative to said sprung shock absorber component about the longitudinal axis of said components to accommodate angular displacement of said road wheel about said steering axis;
a pneumatic spring constructed to be operatively interposed between said sprung vehicle structure and said unsprung shock absorber component whereby a portion of the mass of said sprung vehicle structure is resiliently supported on said unsprung shock absorber component;
said pneumatic spring comprising a flexible annular member that is folded over upon itself to thereby define a rolling lobe portion between its ends;
said flexible annular member being generally concentrically arranged with respect to said shock absorber components and having one of its ends nonrotatably fixed relative to said sprung shock absorber component;
elongated annular means surrounding said unsprung shock absorber component;
bearing means rotatably securing the upper end of said annular means to said unsprung shock absorber components;
said flexible annular member having its other end secured to said elongated annular means with said rolling lobe portion being supported on said elongated annular means;
said bearing means being constructed to transfer the load of said portion of the mass of said sprung vehicle structure from said pneumatic spring to said unsprung shock absorber component;
said bearing means being further constructed to prevent the imposing of a torsional load on said flexible annular member in the event said unsprung shock absorber component is angularly displaced relative to said sprung shock absorber component.

4,555,097

COMBINATION ROUND COIL SPRING AND RECTANGULAR TORSION COIL SPRING ASSEMBLY

Sidney A. Hiatt, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed May 16, 1983, Ser. No. 494,713
Int. Cl.⁴ A47C *23/02*; F16F *1/08*
U.S. Cl. 267—100 **9 Claims**



7. A bedding spring assembly comprising,
a rectangular wire grid formed of a rectangular border wire and two series of parallel grid wires extending between the border wire, said two series of wires being located in a common top plane of said spring assembly and intersecting one another,
a first and second series of coil springs, each of said coil springs of both said first and second series of coil springs having a top convolution connected to said wire grid,
each of said coil springs having a coil shaped body section, the coil shaped body section of said first series being generally round so as to form compression coil springs and the coil shaped body section of said second series being generally rectangular and formed by a succession of straight lengths of wire bent at right angles to the adjacent straight lengths to form rectangular torsion bar coil springs,
said first and second series of compression and torsion bar coil spring cooperating to form a compressible spring assembly having substantial resistance to side-sway of the wire grid top surface of said spring assembly,
said coil springs being arranged in lateral and longitudinal spring rows, and
all of said rectangular torsion bar coil springs being located at the end of either a lateral or a longitudinal spring.

4,555,098

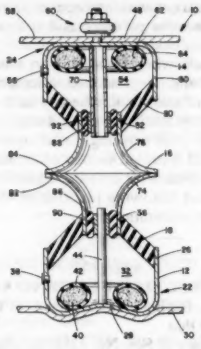
SELF-STABILIZING DRY VISCOUS SPRING DAMPER

Emile M. Shtarkman, Cleveland, Ohio, assignor to Imperial Clevite Inc., Glenview, Ill.

Filed Nov. 25, 1983, Ser. No. 554,906
Int. Cl.⁴ F16F *5/00*
U.S. Cl. 267—140.1 **10 Claims**

1. A viscous spring damper for damping and leveling structural agitation which is resistant to nonaxial deformation comprising:
a first outer housing and a second outer housing;
an elastomeric shear spring associating said first outer housing with said second outer housing;
a selectively pressurizable gas chamber and a subchamber within said gas chamber contained within at least one of said first and second housings; and,
a rigid structural member in which one end is mounted in one of said housings and said other end is received in a

bearing which is mounted to the other housing by an elastomeric bushing whereby said bushing and said structural member allow and control nonaxial deformation within said damper.



4,555,099

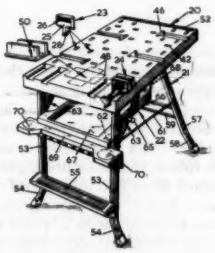
WORKBENCHES

Allan R. Hilton, Bolton, England, assignor to Hilton (Products) Limited, Bolton, England

Filed Jun. 17, 1983, Ser. No. 505,204

Int. Cl.[4] B23Q *3/02*

U.S. Cl. 269—88 **8 Claims**



1. A workbench comprising:

a worktop of unitary construction formed with parallel rows of spaced elongate locating apertures and at least one elongate recess extending inboard from an edge of the worktop, the recess having its long axis parallel with a locating aperture row and terminating in an elongate slot normal to the recess, the slot being defined by a wall downwardly inclined towards the worktop edge and presenting spaced lateral faces and

a vice comprising

a fixed vice jaw having a depending flat hook-like formation adapted to engage in a selected locating aperture non-rotatably to position the fixed vice jaw on the worktop and

a movable vice jaw separate from the fixed vice jaw comprising

an elongate body adapted to be located in a selected elongate recess aligned with a locating aperture selected to receive the fixed vice jaw and having two ends, the elongate body having a depending formation at one end which engages in the elongate slot of the elongate recess and which has lateral inclined extensions which bear against the spaced lateral faces of the slot wall;

a screw arrangement rotatably supported by the elongate body; and

a gripping jaw proper slidably supported on the elongate body and coupled to the screw arrangement whereby rotation of the latter causes the sliding movement of the gripping jaw proper.

4,555,100

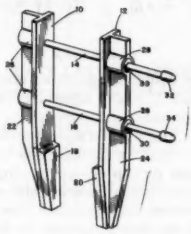
FRICTION LOCKING HAND CLAMP

Joseph R. Ditto, 3440 Helix St., Spring Valley, Calif. 92077

Continuation of Ser. No. 385,929, Jun. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 266,664, May 26, 1981, abandoned. This application Feb. 24, 1984, Ser. No. 583,319

Int. Cl.[4] B25B *1/02*

U.S. Cl. 269—166 **6 Claims**



1. A friction locking hand clamp for objects, comprising:

a plastic base member,

a plastic arm member,

a pair of rigid rods,

said base member and said arm member having substantially identical elongated planar confronting surfaces, said confronting surfaces having correspondingly positioned holes therethrough for receiving said rods, and object clamping portions extending beyond the holes;

said object clamping portions being inclined toward one another;

reinforcing means for providing strength and rigidity to said base member and said arm member confronting surfaces;

said base member reinforcing means including means in cooperative relationship with said base member holes for securing the first ends of said rods in said base member in a parallel spaced relationship;

said arm member reinforcing means including bearing means in cooperative relationship with said arm member holes for permitting slidable movement of said arm member on said rods and rotation of said arm member on said rods equal to the combined angular inclination of said clamping portions toward one another;

means mountable on the second ends of said rods for preventing the removal of said arm member from said rods and protecting the hand of the clamp user from injury by said rod ends,

said preventor and protection means being in cooperative operational relationship with said arm member bearing means to permit maximum opening of the clamp, and

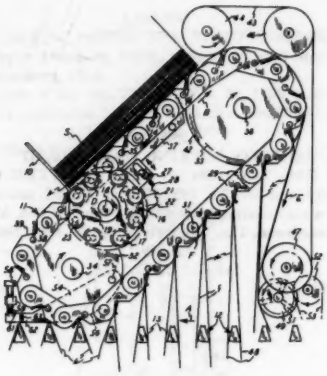
means for increasing the frictional characteristics of said base member and said arm member.

4,555,101

METHOD AND APPARATUS FOR SEPARATING SIGNATURES FROM A STACK

Anton R. Stobb, deceased, late of Pittstown, N.J. (by Walter J. Stobb, executor), assignor to Stobb, Inc., Clinton, N.J.

Filed Mar. 13, 1984, Ser. No. 588,934
Int. Cl.[4] B65H *39/02*
U.S. Cl. 270—58 **16 Claims**



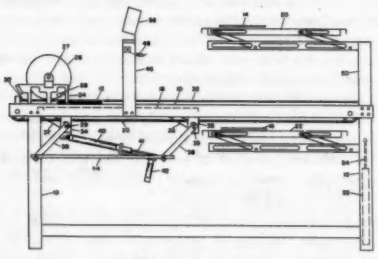
1. A method of collating signatures, comprising the steps of positioning a stack of folded signatures relative to a moving signature collector, said signatures having flaps extending in a plane in said stack, placing said signatures onto a pickup device in signature-movement communication with said stack and said collector, said pickup device moving completely along said flaps and supporting said stack while removing said signatures, singly removing said signatures from said stack with the free edges of said signatures opposite the folds being in a leading movement position, separately depositing the removed signatures onto said collector in spaced-apart locations along said collector while said collector is moving in a direction transverse to the direction of the folds in said signatures when said signatures are deposited onto said collector.

4,555,102

APPARATUS FOR SEPARATING STACKS OF CLOTH

Elbert Engle, Ashville, Ala., assignor to Chesebrough-Pond's, Inc., Greenwich, Conn.

Filed May 11, 1983, Ser. No. 492,721
Int. Cl.[4] B65H *5/22*
U.S. Cl. 271—4 **92 Claims**



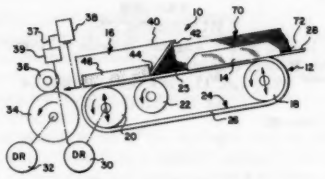
1. Apparatus for removing a single ply of fabric from a stack of fabric plies, comprising a fabric ply transport mechanism arranged for relative motion with respect to said stack and arranged to engage the top fabric ply of said stack and a fabric engaging mechanism mounted on and carried by said transport mechanism, said fabric engaging mechanism comprising an elongated rod mounted to said transport mechanism, and pivotable with respect thereto about a longitudinal axis, pins mounted to said rod and extending therefrom in a direction transverse to said axis, means interconnecting said rod and said transport mechanism for pivoting said rod said axis to rotate said pins from a first orientation substantially perpendicular to the top of said stack, when said transport mechanism engages the top of said stack, to a second orientation substantially parallel to the top of said stack, whereby said engaging mechanism engages the top fabric ply of said stack, said rod further including a plurality of openings, said openings facing said stack when said rod is in said second orientation, and wherein there are provided means for emitting a gas from said openings for a selected period following pivoting of said rod from said first to said second orientation.

4,555,103

BOTTOM LEVEL SHEET FEEDING APPARATUS

Bradley W. Larson, Garland, Tex., assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 529,455, Sep. 6, 1983. This application May 7, 1984, Ser. No. 607,851
Int. Cl.[4] B65H *3/04, 7/02, 3/56*
U.S. Cl. 271—35 **6 Claims**



1. A bottom level sheet feeding apparatus comprising:

means for receiving a stack of paper sheets and having a floor for supporting a stack of sheets;

endless belt conveyor means including an upstream roller positioned beneath said receiving means, a downstream roller, an idler roller intermediate said upstream and downstream rollers, means for driving said rollers and belt means entrained about said rollers, said belt means having a coefficient of friction with paper greater than a coefficient of friction between sheets of paper and an upper run defined by said rollers and extending into said receiving means for conveying sheets therefrom;

lead surface means extending upwardly from said upper run and terminating above said idler roller to form a pinch point with said upper run which approximates a thickness of a sheet of paper;

retard strip means superposed to said upper run and said downstream roller downstream of said lead surface means and having an outer surface with a coefficient of friction with paper less than that of said conveyor means;

a pair of driven puller rolls located downstream of said retard strip means and said endless belt conveyor means and forming a nip positioned to receive a sheet conveyed from a downstream end of said conveyor means, said puller rolls being driven independently of said conveyor means;

means for selectively raising and lowering said upstream roller relative to said floor independently of said downstream roller so that an upstream end of said upper run may be raised into contact with a lowermost sheet in said receiving means to convey that sheet to said pinch point, or lowered to disengage sheets in said receiving means;

means for selectively raising and lowering said downstream roller independently of said upstream roller so that a downstream end of said upper run may be moved downwardly from said retard strip means such that a sheet therebetween is not conveyed thereby, or upwardly sub-

stantially against said retard strip means such that a sheet therebetween is held against said upper run and is conveyed thereby;

means for sensing a gap in sheets occurring between said downstream end of said conveyor means and said puller rolls; and

means responsive to said sensing means for stopping said roller driving means, thereby stopping said conveyor means, and actuating said downstream raising and lowering means to lower said upper run from said retard strip means to allow a sheet to be pulled from between said upper run and said retard strip means by said puller rollers when said sensing means not does detect a gap at a predetermined time interval.

4,555,104

OVERLAPPING DOCUMENT FEED APPARATUS

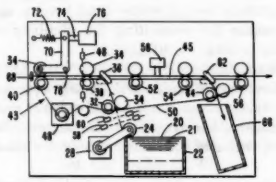
Osamu Fukuju, Yokohama; Yasuhiro Inagaki, Kanagawa, and Katsuji Minoshima, Oiso, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 24, 1984, Ser. No. 653,812

Claims priority, application Japan, Sep. 30, 1983, 58-180964

Int. Cl.[4] B65H *7/02*

U.S. Cl. 271—228 **11 Claims**



1. A document transport system for transporting documents from a stack of documents to a remote distribution station, comprising;

means for feeding a document from the stack along a feed path;

means positioned adjacent said feed path for generating a first control signal upon detecting a plurality of documents in an overlapped condition;

stop means positioned in said feed path;

oppositely positioned drive rollers positioned adjacent said feed path for driving the lead document of the overlapped document against the stop means;

means responsive to the generation of said first control signal for disabling one of said oppositely-positioned drive rollers enabling the other drive roller to move each of the remaining overlapped documents against the stop means superimposed on the lead document;

and means for feeding the superimposed documents from the stop means to a remote distribution station permitting removal of the documents from the system.

4,555,105

METHOD AND APPARATUS UTILIZING MAGNETICALLY COUPLED ROLLERS TO FEED SHEETS

Kenneth L. Wyatt, Oklahoma City, Okla., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,147

Int. Cl.[4] B65H *3/06, 5/06*

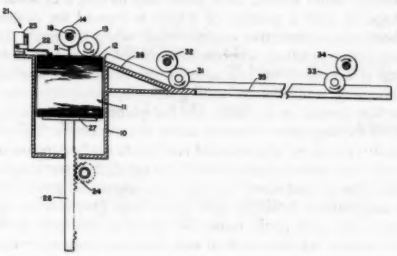
U.S. Cl. 271—264 **15 Claims**

1. An apparatus for feeding a sheet, which comprises:

a first magnetized drive roller;

a shaft for rotatably mounting the first roller with the nadir of its periphery at a predetermined distance from a sheet to be fed; and

a freely supported second roller constructed of paramagnetic material and interposed between the sheet and the first roller and in magnetic contact coupling with the first roller, said second roller having a diameter greater than said predetermined distance so that it rests on the sheet to be fed, magnitude of the magnetic coupling force between



the rollers being selected to maintain driving contact therebetween during the feeding of the sheet by the second roller and to enable separation of the second roller away from the first roller in the presence of any object in the nip between said rollers.

4,555,106

APPARATUS FOR COLLATING SHEETS OF PAPER

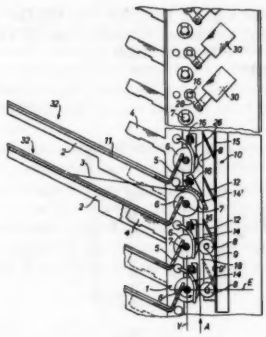
Kurt Ruenzi, Kuesnachterstrasse 59, CH-8126 Zumikon, Switzerland

Filed Oct. 20, 1983, Ser. No. 543,984

Claims priority, application Switzerland, Oct. 27, 1982, 6266/82

Int. Cl.[4] B65H *29/58*

U.S. Cl. 271—297 **7 Claims**



1. An apparatus for collating sheets of paper, comprising frame means, sheet feeding channel means including sheet feeding roller means defining a vertically extending sheet feeding path in said frame means, a plurality of collating compartments held by said frame means in a vertical compartment stack, sheet deflecting means including guide flaps for each compartment and operatively arranged in said channel means above a respective sheet feeding roller means, operating means connected to said guide flaps for moving a respective guide flap into a passive position in which a sheet may pass the guide flap and into an active position in which a sheet is deflected into a respective collating compartment, support means in said frame means for holding each collating compartment at an upward slant so that a lower compartment end reaches into a position for cooperating with a respective one of said sheet feeding roller means and for cooperation with a respective

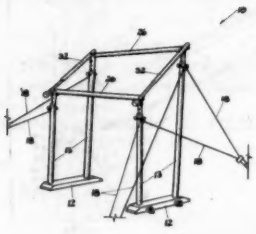
guide flap, said operating means for said guide flaps supporting said guide flaps above the respective sheet feeding roller means in such a manner that each guide flap reaches in its passive position into a space between adjacent feeding roller means and so that each guide flap extends on both sides of a horizontal plane passing through a rotational axis of the respective feeding roller means, each guide flap having a cross-sectional shape at least a portion of which is curved for deflecting a sheet into a respective compartment when the guide flap is in said active position, wherein said curved portion of each guide flap is arranged on one side of the respective flap for said deflecting, and wherein each guide flap comprises rear guide surface means on its back side for guiding a sheet along said sheet feeding channel means when the respective flap is in said passive position, wherein said rear guide surface means of each guide flap extend approximately in parallel to the longitudinal extension of said sheet feeding path when said guide flaps are in said passive position, said guide flaps **(14)** having on their upper rear part projections **(24)** carrying said rear guide surface means, wherein each of said collating compartments comprises a lower stop member **(5)** extending upwardly and reaching into a space between said sheet feeding roller means so that the upper ends of said guide flaps **(14)** reach over the respective stop member **(5)**, wherein said curved portion of each guide flap is substantially circular and extends for about 90° and wherein each guide flap also comprises a flat portion extending substantially tangentially relative to said curved portion and away from a hinging axis of the respective guide flap, wherein said operating means comprise a square drive rod and means for releasably and flexibly securing said guide flaps to the respective square drive rod, and wherein said securing means comprise elastically yielding clamping elements for clamping the guide flaps to the respective square rod.

4,555,107

UNEVEN BARS

Lance M. Otto, 309 South Rd., Mile End, South Australia, Australia

Filed Sep. 12, 1983, Ser. No. 531,226
Claims priority, application Australia, Sep. 10, 1982, PF5842
Int. Cl.⁴ A63B *3/00*
U.S. Cl. 272—63 **6 Claims**



1. Gymnastic apparatus of the type known as "uneven or asymmetric" bars comprising support means, four uprights supported by said support means and arranged in a rectangular configuration, each upright having a slidable post extension extending upwardly therefrom so as to provide bar height adjustment means, and a pair of spaced longitudinally extending parallel working bars supported by the uprights, the ends of each working bar being coupled to respective mounting means carried by the upper free ends of said post extensions, characterised by:

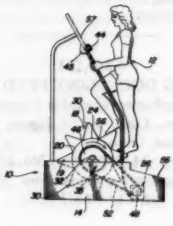
a pair of link bars extending between respective laterally aligned pairs of said uprights, pivot attachment means pivotally connecting each end of each said link bar to a respective one of said post extensions in proximity to the axis of the corresponding one of said working bars, each link bar comprising length adjustment means operable to effect length adjustment of said link bar and in turn adjustment of the spacing or width between the working bars.

4,555,108

EXERCISING AND PHYSICAL-CONDITIONING APPARATUS

Frank G. Monteiro, 599 Marquette Cir., Costa Mesa, Calif. 92626

Filed Mar. 12, 1984, Ser. No. 588,804
Int. Cl.⁴ A63B *23/06*
U.S. Cl. 272—69 **7 Claims**



1. An exercising and physical-conditioning apparatus that provides a means for simulating the climbing of stairs, the apparatus comprising:

a base-support structure;

a rotatable stair means supported on said base-support structure for rotation about a horizontal axis;

a hydraulic-control means operably connected to said rotatable stair means, whereby the rotation thereof is selectively operable;

drive means interconnecting said rotatable stair means and said hydraulic-control means, said hydraulic-control means being activated by the rotation of said stair means, and the rotation of said stair means being provided by the treading action of the operator engaged thereon;

wherein said rotational stair means comprises:

a rotatable structural member having extending horizontal shaft members defining said horizontal axis thereof;

bearing means mounted to said base-support structure, and adapted to receive said shaft members for rotation therein; and

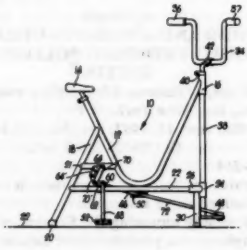
a plurality of step members fixedly secured to said rotatable structural member, and positioned to extend radially outward from said horizontal axis thereof.

4,555,109

EXERCISING MACHINE

Joseph C. Hartmann, 4030 N. Tracy, Kansas City, Mo. 64116

Filed Sep. 14, 1983, Ser. No. 532,223
Int. Cl.⁴ A63B *21/00*
U.S. Cl. 272—73 **18 Claims**



1. An exercising machine for permitting physical exertion

and bodily movements comparable to the normal, human acts of walking, running or jogging for the sake of developing and maintaining physical fitness, said machine comprising:

a frame having base means, presenting a bottom by which the frame is supported and stabilized in an immobile condition on an underlying surface;

a handlebar having a pair of spaced portions adapted to be grasped by the hands;

means intermediate the ends of the handlebar between said portions pivotally mounting the same on the frame for oscillatory movement about an essentially upright axis extending upwardly from the frame;

a pair of elongated cranks, one on each side respectively of the frame and disposed downwardly and rearwardly of the handlebar above said surface;

means for each crank respectively pivotally attaching the same to the frame for limited oscillatory movement about a substantially horizontal axis transversely of the frame;

means operably intercoupling the cranks for simultaneous oscillation;

a foot pedal pivotally secured to each crank respectively at one of the ends of the cranks; and

means operably interconnecting one of the cranks and said pivotally mounting means for synchronizing the oscillatory movements of the handlebar and the cranks whereby said movements may be powered by a human operator's legs, arms or both.

4,555,110

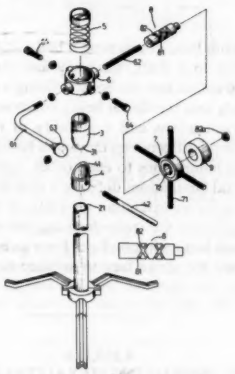
BALL-HITTING TRAINING DEVICE

Kuo Hai-Ping, No. 528-10, Jen-Ai Village, Jen-Teh Hsiang, Tainan Hsien, Taiwan

Continuation-in-part of Ser. No. 462,333, Jan. 31, 1983, abandoned. This application Jun. 8, 1984, Ser. No. 618,840

Int. Cl.[4] A63B *69/40*

U.S. Cl. 273—26 E **5 Claims**



1. A practice device for ball hitting, comprising:

a ball;

a vertically supported shaft;

a first rotor means to receive said ball at a horizontal distance from said shaft to allow said ball to co-rotate with the rotor to revolve horizontally around said shaft;

characterized by that a damping mechanism is provided to decelerate the revolution of said rotor, comprising a second rotor mounted to make rotation around a horizontal axis extending from said shaft, and hampering means not at the same height as the rotating center of said second rotor;

said second rotor having at least a protruding portion having a relatively large distal extension extending from its rotating center in the radial direction of said horizontal axis, said distal extension being such that when the second rotor revolves around said shaft, the protruding portion can impact upon said hampering means, yet the revolution of the second rotor is not stopped thereby, and the protruding portion can then pass over said hampering means by making rotation about said horizontal axis.

4,555,111

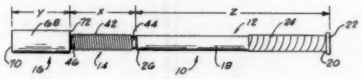
PRACTICE BAT

Manuel R. Alvarez, 3052 Nevada St., El Monte, Calif. 91731

Filed Aug. 26, 1983, Ser. No. 526,602

Int. Cl.[4] A63B *69/40*

U.S. Cl. 273—26 B **2 Claims**



1. A baseball practice bat capable of being adjusted to the individual needs of a particular person during warmup to assist the person in snapping both wrists upon follow through during a swing of the arms comprising:

an elongated handle portion of a length to receive both hands of a person and the handle portion has inner and outer ends with a hand stop formed at said outer end;

a replaceable weighted end portion including outer and inner ends wherein said weighted end portion is annular and of a lesser length than said handle portion, and the hands are not to engage said weighted end portion when said practice bat is swung;

a replaceable enlongated coil spring of at least several convolutions and having opposed ends, said spring interposed by releaseable securing means between said weighted end portion and the inner end of said handle portion;

said releaseable securing means including plug means with a threaded bore in said inner end of said handle portion and a threaded bore in the inner end of said weighted end portion and threaded shafts projecting from each end of said coil spring ends engageable with said threaded bores for releaseable maintaining the handle portion, coil spring and weighted end portion together in an in line arrangement; and

said in line arrangement creating a bat wherein all the parts have an elongated axis extending therethrough when in an at rest position, but upon swinging the same flexing at least a part of the coil spring and the weighted end portion rearward and forward of said axis due to the momentum of the weight in relation to the hands during said swing whereby both wrists of said person will snap.

4,555,112

GOLF CLUB SHAFTS WITH MATCHED FREQUENCIES OF VIBRATION

Mohammad Masghati, Addison, Ill., assignor to Wilson Sporting Goods Company, River Grove, Ill.

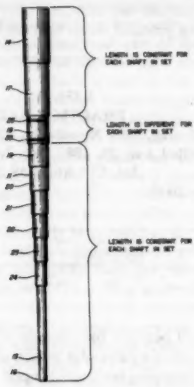
Filed Sep. 22, 1983, Ser. No. 534,809

Int. Cl.[4] A63B *53/12*

U.S. Cl. 273—77 A **8 Claims**

1. A set of golf club shafts comprising a plurality of shafts, each shaft having a butt portion and a tip portion and a fixed number of stepped portions of decreasing diameter between the butt portion and the tip portion, the number of stepped portions of each shaft being the same for each shaft of the set, the length of the butt portion and the length of the tip portion being the same for each shaft of the set, the length of one of the stepped portions of each shaft being different for each shaft and the length of each of the other stepped portions of each shaft being the same as the length of the corresponding stepped

portion of each of the other shafts, the overall length of each shaft being different for each shaft, the difference in overall length between any two shafts being the same as the difference in the lengths of said one stepped portion of the two shafts.



4,555,113

SHAFT AND A METHOD FOR PRODUCING THE SAME

Fumio Shimazaki, Tokyo; Koji Asai, and Jiro Ohno, both of Saitama, all of Japan, assignors to Komei Shibata, Columbus, Miss.

Filed Jul. 11, 1983, Ser. No. 512,653

Claims priority, application Japan, Apr. 6, 1983, 58-50258; Apr. 6, 1983, 58-50259

Int. Cl.⁴ A63B *53/10*

U.S. Cl. 273—80 B **5 Claims**

1. A shaft consisting of:

a shaft body consisting of inorganic fiber cloth and plastic resin; and

two sets of tapes made of carbon cloth and spirally wound around said shaft body for its entire length, said two sets of tapes being in opposite directions from each other, and each one of said sets of tapes including at least two tapes wound in parallel, whereby said sets of tapes comes across on said shaft body to form crossing portions at least every 90 degrees of rotation about said shaft body.

4,555,114

TABLE GAME PUCK

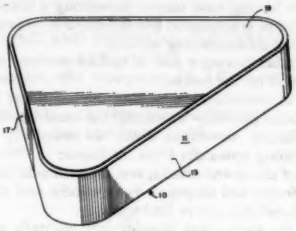
William Dozier, Rte. 1, Siloam Springs, Ark. 72761

Filed Oct. 31, 1983, Ser. No. 547,013

Int. Cl.⁴ A63B *71/00*

U.S. Cl. 273—128 R **14 Claims**

1. A parlor game puck comprising a body of plastic foam material having a density of less than ten pounds per cubic foot, a height of from one-quarter inch to one inch, a horizontal surface outline for which an inscribed circle is less than two inches diameter and a circumscribed circle is greater than two inches diameter, a flat bottom, at least one side with a flat surface at a right angle to said flat bottom, and a surface on the bottom of said body having a sliding friction coefficient on clean, dry window glass between 0.3 and 0.9.



4,555,115

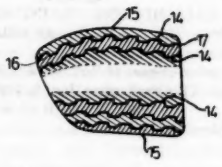
GOLF CLUB HEAD CONSTRUCTION

Chin-San You, No. 3, La. 1029, Fong-Shih Rd., Fong Yuan City, Taiwan

Filed Jun. 7, 1984, Ser. No. 618,028

Int. Cl.⁴ A63B *53/04;* **B32B** *3/30*

U.S. Cl. 273—167 R **5 Claims**



1. A golf club head comprising a body and a throat adapted for connection to a shaft, the body and the throat being of unitary construction and the body defining a strike face for the head, the body and the throat being constructed of a plurality of wooden laminations and a plurality of resin impregnated fiber layers disposed between the wood laminations and securing the wood laminations to each other, opposing surfaces of adjoining wood laminations defining a plurality of interlocking tongues-and-grooves extending generally in the direction substantially parallel to the strike face and distributed across the opposing wood lamination surfaces from an edge of the laminations proximate the strike face to another edge of the laminations.

4,555,116

GO GAME EMPLOYING HEXAGONALLY SHAPED SPACES

F. Herbert Fields, 1691 Annie St., Colma, Calif. 94015

Filed Jun. 10, 1982, Ser. No. 387,091

Int. Cl.⁴ A63F *3/00*

U.S. Cl. 273—236 **14 Claims**

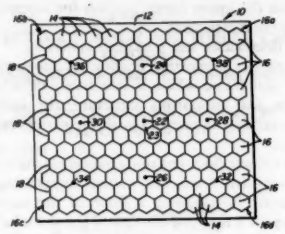
14. Game apparatus for playing GO, comprising:

a game board having a playing surface and first indicia thereon defining an area of play formed from a number of equi-dimensional hexagons arranged in a substantially rectangular configuration of horizontal rows;

second indicia denoting nine substantially identical predetermined points of play on the playing surface and within the defined area of play, a first one of the denoted points of play being located generally in the center of a substantially central hexagon; and

two sets of game pieces for disposition on the playing sur-

face, the game pieces being substantially identical to one another in size and shape and having third indicia for



distinguishing the game pieces of the first set from the game pieces of the second set.

4,555,117

LIQUID SHAFT PACKING HAVING A REDUCED SLIDE RING TEMPERATURE

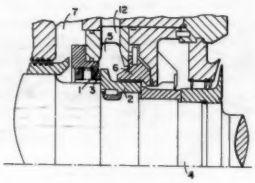
Joachim Kotzur, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,905

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329034

Int. Cl.[4] F16J *15/34, 15/40*

U.S. Cl. 277—173 **1 Claim**



1. A liquid packing for a rotating shaft, comprising a seal ring adapted to be connected to the shaft for rotating with the shaft at the same speed thereof, and a housing accommodating said shaft, a non-rotating seal ring tightly fitted to said housing and being axially displaceable under stress, said rotating seal ring being made of a material of high thermal conductivity and high strength having a high sealing surface with high surface hardness, and including at least one floating ring disposed around said rotating seal ring and defining a seal gap with said rotating seal ring which is concentric with the axis of said shaft.

4,555,118

SEAL CONSTRUCTION FOR FLUID SWIVEL JOINTS

Kenneth C. Saliger, DeSoto, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,826

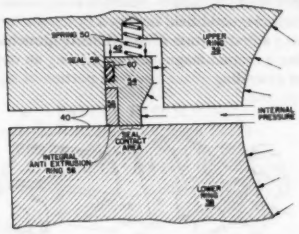
Int. Cl.[4] F16S *9/00*

U.S. Cl. 277—188 R **18 Claims**

1. A sealed fluid swivel joint, comprising:

a. first and second adjacent joint rings which are rotatable relative to each other about a common central longitudinal axis and defining a small annular, ring-shaped clearance gap therebetween to allow relative rotational movement between the first and second joint rings, said first adjacent ring defining an annular seal housing groove adjacent to said clearance gap;

b. an annular seal positioned in said annular seal housing groove and adapted to provide a seal between said first joint ring and said second joint ring, said annular seal including an annular, pliant sealing member, and a relatively stiff annular antiextrusion ring to prevent the pliant sealing member from being deformed into said clearance gap by the fluid pressure differential existing across said annular seal, and means for biasing said annular sealing member against an adjacent annular sealing surface to



provide an effective fluid seal therebetween, said biasing means being responsive to the pressure differential existing across said annular seal to pressure bias said annular sealing member against a sealing surface, and said annular sealing member including a V-shaped, concave slot therein extending along its annular length.

4,555,119

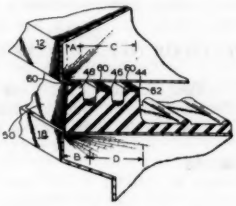
CASKET SEALING GASKET

Joseph R. Semon, Dalton, Pa., assignor to Casket Shells, Inc., Eynon, Pa.

Filed Jul. 22, 1981, Ser. No. 285,786

Int. Cl.[4] A61G *17/00*

U.S. Cl. 277—207 R **13 Claims**



1. An improved casket sealing gasket which comprises:

a gasket body of deformable material adapted to form a continuous seal within the joint defined by a casket body and its lid;

a plurality of sealing ridges atop the gasket body said sealing ridges disposed parallel to the gasket body periphery;

a plurality of contact points formed by small continuous protuberances in at least one of said sealing ridges uppermost surface; and

the uppermost surface of at least one sealing ridge being concave forming two substantially parallel contact points.

4,555,120

POSITION SENSOR

John S. Frait; Clark E. Lowman, both of Ann Arbor, Mich.; George W. Morris, III, Greenville, S.C., and Leonard T. Tribe, Seal Beach, Calif., assignors to Kelsey-Hayes Co., Romulus, Mich.

Filed Oct. 7, 1983, Ser. No. 540,083

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—6.1 **30 Claims**

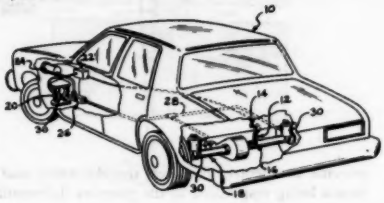
1. A position sensor for determining the relative position

between two members relatively movable with respect to one another, said sensor comprising:

an assembly including a first component slidable relative to a second component;

means for attaching said first component to one of the relatively movable members and said second component to the other one of the relatively movable members;

magnet means carried by said first component for generating a first magnetic field having a first polarity and extending along a first portion of said first component and for generating a second magnetic field having an opposite polarity and extending along a second portion of said first component; and



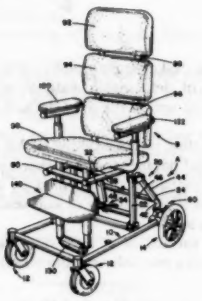
detector means including a pair of spaced apart detector devices carried by said second component and responsive to the first and second magnetic fields for generating a position signal representative of the position between the two members, one of said detector devices generating a first logic signal at a high level when proximate said first magnetic field and at a low level when proximate said second magnetic field, and the other one of said detector devices generating a second logic signal at a low level when proximate said first magnetic field and at a high level when proximate said second magnetic field.

4,555,121

INVALID'S CHAIR TO FACILITATE TRANSFER TO AN AUTOMOBILE

Walter G. Lockard; Nathalal G. Patel, and Allen J. Boris, all of Elyria, Ohio, assignors to Invacare Corporation, Elyria, Ohio

Filed Sep. 20, 1984, Ser. No. 652,289
Int. Cl.[4] B62B *11/00*
U.S. Cl. 280—30 **18 Claims**



1. A stroller for facilitating access to motor vehicles, the stroller comprising:

(a) a base including:

(i) a lower frame portion,

(ii) wheels for supporting the lower frame portion such that at least a forward end of the lower frame portion is able to be rolled beneath an undercarriage of the motor vehicle,

(iii) an upper frame portion operatively connected with the lower frame portion,

(iv) a seat supporting structure operatively connected with the upper frame portion for supporting a detachable seat structure;

(b) the detachable seat structure including:

(i) a patient supporting portion for supporting a patient,

(ii) a seat frame which is selectively detachable with the base seat supporting structure, the seat frame being operatively connected with the patient supporting portion,

(iii) a vehicle floor engaging means extending forward and downward from the patient supporting portion for selectively engaging a floor of the motor vehicle to support a forward portion of the detachable seat structure during entry into and departure from the motor vehicle,

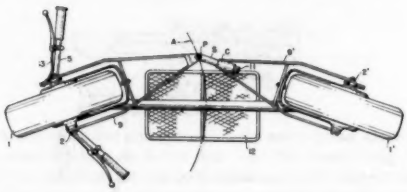
(iv) manual grasping means operatively connected with a rearward portion of the seat frame to facilitate lifting the rearward seat structure portion during entry into and departure from the motor vehicle.

4,555,122

TRACKING SCOOTER AND THE LIKE AND METHOD OF OPERATION

Kenneth C. Harvey, P.O. Box 42, 316 Wilester Lake Rd., West Franklin, N.H. 03235

Filed Nov. 17, 1982, Ser. No. 442,320
Int. Cl.[4] B62K *21/00*
U.S. Cl. 280—87.04 R **2 Claims**



1. A scooter and the like having, in combination, a longitudinally extending central platform having integrally connected forwardly and rearwardly extending upward arcuate support bars; a forward vertically mounted yoke provided with upper steering means for manual engagement by a user and a lower transverse axle mounting the front wheel and rotatably mounted through the forward end of the forward support bar to enable the steering means to turn the front wheel about the vertical axis of the forward yoke said vertical axis intersecting said axle; a rearward vertically mounted yoke rotatably mounted at its upper end through the rearward end of the rearward support bar and provided at its lower end with a transverse axle mounting the rear wheel, said rearward yoke having a vertical rotational axis that intersects the last-mentioned axle; a forward horizontally mounted yoke connected to the front wheel axle and converging to a pivot point below the central region of the platform; a rearward horizontally mounted yoke connected to the rear wheel axle and converging to a sleeve slidable along a slide cylinder pivoted at said pivot point, wherein steering of the scooter may be achieved by rotation of the steering means by the user for turning the forward vertically mounted yoke, the forward horizontally mounted yoke, and the forward wheel turn about the first-mentioned vertical axis to an angle with respect to the longitudinal axis of the central platform and causing the pivot point to move to the sides of the central platform axis, with the rear wheel yoke sleeve sliding upon the slide cylinder thereby turning the rearward vertically mounted yoke, the rearward horizontally mounted yoke, and the rear wheel about the second-mentioned

vertical axis by an equal angle in the opposite direction with respect to the central platform axis.

4,555,123

PROTECTIVE FLANGE FOR WHEEL CASTOR HOUSING

Houston Rehrig, 4539 Gorham St., Corona Del Mar, Calif. 92625

Filed Jan. 5, 1983, Ser. No. 455,739
Int. Cl.[4] B60B *33/00*
U.S. Cl. 280—160 **2 Claims**

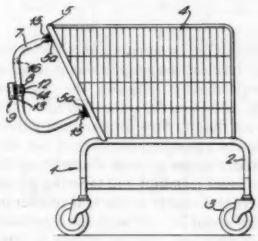
1. A wheeled cart comprising:
a frame having two corners;
a pair of wheels connected to and extending downwardly from said frame adjacent said corners; and
flange means for each wheel of said pair of wheels connected to said frame for protecting said wheels, each of said flanges being located adjacent its respective wheel and extending rearwardly with respect to said cart and downwardly and laterally outwardly with respect to said frame to prevent said wheels from damaging adjacent objects and to shield said wheel from lateral and upwardly directed impacts, wherein said flange means is attached to said frame in a manner that prevents said flange means from damaging adjacent objects due to impacts with said cart.

4,555,124

TROLLEY FOR USE WITH A WHEELCHAIR

Michael J. Millington, Eastleigh, England, assignor to Handicart Limited, New Malden, England

Filed Sep. 6, 1983, Ser. No. 529,699
Claims priority, application United Kingdom, Sep. 7, 1982, 8225515
Int. Cl.[4] A61G *5/02*
U.S. Cl. 280—289 WC **12 Claims**



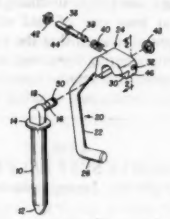
1. A trolley for attachment to a wheelchair comprising a frame, a plurality of jockey wheels attached to said frame which are rotatable about a horizontal axis and are capable of swinging about a vertical axis, a load carrying portion supported on said frame, and two clamping arms, one of said clamping arms being positioned at each side of said trolley, and a clamp attached to each of said clamping arms for attaching said trolley to the frame of the wheelchair, and means adjustably attaching at least one of said clamping arms to a frame member of said trolley whereby said trolley may be attached to any one of a plurality of wheelchairs of different widths, and means in the form of a single control member, which is adjustable by using one hand only to adjust at least one of said two clamping arms in a lateral direction relative to the other of said two clamping arms to completely and securely attach said clamps of said trolley to a wheelchair.

4,555,125

SAFETY HITCH PIN

Gerol L. Goodlove, R.R. #1, Palo, Iowa 52324

Filed Jun. 24, 1983, Ser. No. 507,479
Int. Cl.[4] B60D *1/00*
U.S. Cl. 280—515 **4 Claims**



1. A safety hitch pin for connecting a towing vehicle to a towed vehicle, said hitch pin comprising a pin having a collar near its upper end, a handle mounting member extending transversely of the upper end of said pin above the collar and having a transverse opening formed therein, a handle having an enlarged portion at its upper end mounted on said mounting member for pivotal movement from an upper unlocked position to a lower locked position, the enlarged portion of the handle having an opening therein extending transversely to the mounting member, the handle being formed so that its lower end engages the pin near the lower end of the pin when the handle is in the lower locked position, a manually-operated positive-locking member combined with the upper end of the handle and moveable within the opening in said handle into and out of the opening in the handle mounting member so as to maintain the handle in its lower locked position until manually unlocked, and means to normally maintain the handle and pin in assembled condition.

4,555,126

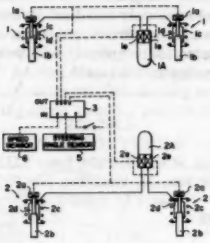
VEHICLE SUSPENSION SYSTEM

Ikuo Ishimitsu; Toshimichi Tokunaga; Takeshi Tanaka, and Yoshiaki Anan, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Oct. 17, 1983, Ser. No. 542,652
Claims priority, application Japan, Oct. 18, 1982, 57-182367; Oct. 18, 1982, 57-182368
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—707 **18 Claims**

1. A vehicle suspension system comprising a set of front wheel suspension assemblies for resiliently suspending the front wheels of a vehicle, a set of rear wheel suspension assemblies for resiliently suspending the rear wheels of the vehicle, at least one of said set of front wheel suspension assemblies and said set of rear wheel suspension assemblies having a variable suspension characteristic, an adjusting means for changing the suspension characteristic of the at least one of said sets of

wheel suspension assemblies, a steering angle sensor operable to detect the angle of steering for generating a steering signal upon detection of a steering angle exceeding a predetermined level, and a controller adapted to send out, upon receipt of the steering signal from said steering angle sensor, a control signal



to said adjusting means so as to change the suspension characteristic of the at least one of said sets of wheel suspension assemblies in a manner such that the steering characteristic of the vehicle during steering operation is changed in a direction toward an oversteer characteristic as compared with the steering characteristic during non-steering operation.

4,555,127

PASSIVE SEAT BELT SYSTEM

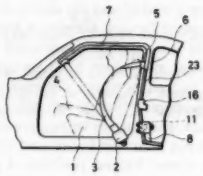
Osamu Kawai, Fujisawa, Japan, assignor to NSK-Warner K.K., Japan

Filed Feb. 28, 1984, Ser. No. 584,318

Claims priority, application Japan, Mar. 17, 1983, 58-38838[U]

Int. Cl.⁴ B60R *21/10*

U.S. Cl. 280—806 **12 Claims**



1. A passive seat belt system comprising:

a guide rail provided on the body of a vehicle;

a runner movable along the guide rail so as to guide a webbing between an occupant-restraining position and an occupant-releasing position;

a force-transmitting member connected with the runner and driven along the length of the guide rail by drive means;

an inertia-sensing member movable in response to changes in speed of the vehicle; and

a pawl operable by the inertia-sensing member in the case of an emergency of the vehicle so that the pawl is brought into engagement with the force-transmitting member to restrain any further movement of the runner along the guide rail.

4,555,128

FOLDABLE SUPPORT STAND

Stephen R. White, 3 Florence Ave., Binghamton, N.Y. 13905, and Jeffrey N. Feinberg, 6 Brookside Rd., Binghamton, N.Y. 13903

Filed Jan. 31, 1984, Ser. No. 575,699

Int. Cl.⁴ B42D *9/00*

U.S. Cl. 281—45 **9 Claims**

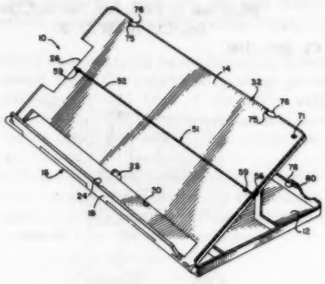
1. A support device which can be used as a reading stand or a writing support surface, comprising:

a base portion;

an upper support panel having upper and lower surfaces;

a hinge connecting said base portion to one edge of said support panel; and

page holder means for holding the pages of a book open against the upper surface of said support panel, said page holder means comprising an elastic band having opposite



ends attached to the lower surface of said support panel, said elastic band being sufficiently long to stretch over the upper surface of said support panel and being movable between two positions, in one of said positions said elastic band being stretched along said upper surface to hold a book thereon and in said other position being disposed along said lower surface for storage when said support device is used as a writing support surface.

4,555,129

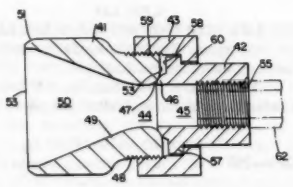
ADAPTER UNION AND IMPROVED ADAPTER MEMBER THEREFOR

Irwin H. Davlin, 714 S. Court St., Opelousas, La. 70570

Continuation of Ser. No. 214,959, Dec. 9, 1980, abandoned. This application Aug. 15, 1984, Ser. No. 614,215

Int. Cl.⁴ F16L *37/10*

U.S. Cl. 285—3 **20 Claims**



1. An adapter union comprising an adapter member having inner and outer termini, the adapter member having an opening extending longitudinally between the said outer terminus thereof and the said inner terminus thereof to thereby provide a passageway for fluid to flow longitudinally therethrough, the said longitudinally extending opening in the adapter member having a markedly larger internal diameter at the outer terminus than at the inner terminus and tapering gradually from the said larger internal diameter to the said smaller internal diameter at an angle of about 20°–30° with the longitudinal axis of the said opening therein and then increasing in internal diameter adjacent the inner terminus to thereby form an annular convex sealing surface thereon, the wall of the said adapter member increasing markedly in thickness between the said outer and inner termini thereof to thereby greatly increase the initial strength of the adapter member in the vicinity of the transition from the said larger internal diameter to the said smaller internal diameter, a conduit receiving member having inner and

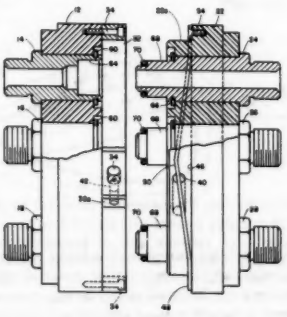
outer termini, the conduit receiving member having an opening extending between the said inner terminus thereof and the said outer terminus thereof to thereby provide a passageway for fluid to flow longitudinally therethrough, the said inner terminus of the adapter member including first pressure sealing means around the said opening therein comprising said annular convex sealing surface thereon, the said inner terminus of the conduit receiving member including second pressure sealing means around the opening therein comprising an annular convex sealing surface thereon the said first and second pressure sealing means cooperating to form a fluid tight seal therebetween with the opening in the conduit receiving member being in communication with the opening in the adapter member when force is applied to the adapter member and conduit receiving member longitudinally in directions toward their respective inner termini, releasable force applying means carried by the adapter member and the conduit receiving member for releasably applying force thereto longitudinally in directions toward their respective inner termini, the said first and second pressure sealing means being urged into a fluid tight sealing relationship and the opening in the conduit receiving member being in communication with the opening in the adapter member when the said force is being applied thereto, the said first and second pressure sealing means including said annular convex sealing surfaces whereby the resultant minimized surface area, the said first and second pressure sealing means being rendered ineffective to form a fluid tight seal therebetween and the opening in the conduit receiving member being out of assured communication with the opening in the adapter member when the said force is no longer being applied thereto, the adapter member including contoured surface means adjacent the outer terminus thereof for adapting it to be permanently installed by welding around an opening in the wall of a container for fluids with the said opening in the adapter member being in communication with the interior of the said container for fluids, and the conduit receiving member including means adjacent the outer terminus thereof for attaching a conduit for fluids thereto whereby the interior of the said conduit is in communication successively with the said opening in the conduit receiving member and the said opening in the adapter member.

4,555,130

DIVER'S UMBILICAL QUICK-DISCONNECT DEVICE

D. Wayne McClain, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1983, Ser. No. 481,174
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—26 **8 Claims**



1. A diver's life support umbilical quick-disconnect device for coupling and uncoupling a plurality of first hoses and a like plurality of second hoses, said device comprising:

a first generally rectangular body;

a plurality of first hose coupling elements extending through said first body and disposed in spaced, side-by-side parallel relation along the long axis of said first body with their corresponding coupling element engaging ends located on one side of said first body;

means defining a rim around the peripheral portion of said one side of said first body;

a second generally rectangular body having a main portion and a reduced portion defining therebetween a peripheral shoulder extending about said second body, said reduced portion being received in said rim;

a plurality of second hose coupling elements extending through said second body and disposed in spaced, side-by-side parallel relation along the long axis of said second body with their corresponding coupling element engaging ends engaged with the coupling element engaging ends of said first hose coupling elements;

a plurality of sealing means, each operative to provide a seal between corresponding ones of said first and second coupling elements;

spring means, disposed between and compressed by said shoulder and said rim for urging said bodies away from one another; and

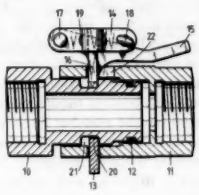
retainer means, cooperating with said first and second bodies for holding said bodies together against the urging of said spring means, said retainer means being actuable to release said bodies for movement away from one another under the influence of said spring means so as to disengage said coupling elements.

4,555,131

COUPLING FOR CONNECTING HOSE OR PIPE ENDS

Karl Weinhold, Im Jagdfeld 43, 4040 Neuss, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 464,264
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204048
Int. Cl.[4] F16L *21/08*
U.S. Cl. 285—91 **17 Claims**



1. A coupling for connecting conduit ends to each other, comprising in combination:

(a) a sleeve portion having first and second opposed ends and adapted to be secured, via said first end, to a first conduit end;

(b) a generally cylindrical insert portion having an outer periphery, said insert portion being adapted to be secured to a second conduit end, being insertable axially into said sleeve portion, and being provided with means defining at least one recess extending radially inwardly from the outer periphery of said insert portion;

(c) sealing means carried by one of said portions for establishing a seal between said portions when said insert portion is inserted into said sleeve portion;

(d) a yoke member surrounding, and movable relative to, said sleeve portion;

(e) a pivotal locking element having a first bolt, and means supporting said locking element on said yoke member for pivotal movement relative to said yoke member about a pivot axis between a coupling locking position and a coupling unlocking position; and

(f) a second bolt generally integral with said yoke member;

(g) means on said sleeve portion engageable by said first and second bolts;

(h) said pivotal locking member being movable into said coupling locking position for causing both said first and second bolts to engage both said means on said sleeve portion and said at least one recess at diametrically opposite locations, when said insert portion is inserted into said sleeve portion, to prevent removal of said insert portion from said sleeve portion, and said coupling unlocking position in which said first bolt is disengaged from said at least one recess and said yoke is movable to disengage said second bolt from said at least one recess to permit removal of said insert portion from said sleeve portion.

4,555,132

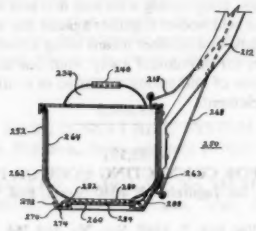
PORTABLE CANINE COMMODE

John Takoushian, 741 Rutland Ave., Teaneck, N.J. 07666

Continuation-in-part of Ser. No. 030,603, Apr. 16, 1979, abandoned. This application Oct. 24, 1980, Ser. No. 200,455

Int. Cl.⁴ A01K *29/00*

U.S. Cl. 294—1.5 **14 Claims**



1. A portable pet toilet comprising:

(a) a receptacle member having a side wall element, said receptacle member defining a top mouth portion and a bottom mouth portion, and further comprising a bottom wall element and a top lid member that are pivotably mounted on said receptacle member, said top lid member closing said top mouth portion and said bottom wall element closing said bottom mouth portion,

(b) an elongated handle member fixedly connected at a first end thereof to an outer wall area of said receptacle member, said handle member having a free second end and being angularly disposed with respect to the horizontal,

(c) top lid actuating means and bottom wall actuating means located at said handle member, said actuating means permitting said top lid member and said bottom wall element to be moved from respective first positions at said mouth portions to a second position whereby the interior of said receptacle member is accessible,

(d) an insert receptacle disposed within said receptacle member, said insert receptacle having openings at, respectively, its top and bottom, and

(e) said bottom wall element comprising an inside surface cover element removably disposed at said bottom wall inside surface, said insert receptacle bottom opening being closable by said bottom wall element, with said inside surface cover element disposed partly between said insert receptacle and said bottom wall element such that said inside surface cover element is disposed only at the said bottom opening of said receptacle member, said inside surface cover element comprising a generally concave lower portion and said bottom wall element comprising a raised portion that is received by and engages said concave lower portion of said inside surface cover element, whereby said inside surface cover element is retained in position.

4,555,133

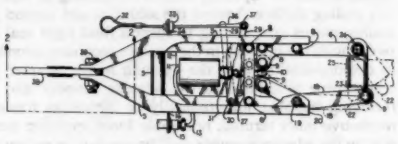
CONTAINER RESTRAINT RELEASE

Donald P. Danielsen, Long Beach, and Lewell M. Lively, Jr., Anaheim, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 27, 1983, Ser. No. 565,640

Int. Cl.⁴ B66C *1/38*

U.S. Cl. 294—82.24 **12 Claims**



1. A retainer/release mechanism for air dropped cargo restrained by straps comprising:

a frame;

a fixed arm attached to said frame;

a release arm, having first and second ends, pivotally attached to said frame at a point intermediate said first and second ends and having a cam mating surface near said second end and oriented generally opposite and spaced from said fixed arm;

means to restrain and release said release arm;

a restraint arm, adapted to receive said strap, pivotally attached at one end of said fixed arm and having the free end terminating in a cam surface which engages said cam mating surface on said release arm when said release arm is restrained so as to bridge between said fixed arm and said release arm and not engage said cam mating surface when said release arm is released; and

means to provide a side load on said second end of said release arm tending to rotate said second end of said release arm away from said fixed arm.

4,555,134

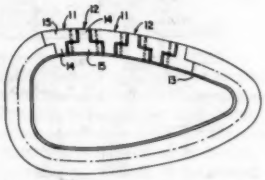
CRUSH RESISTANT MOTOR VEHICLE BODY

Leo Gruna, P2-5B Panther Valley, Hackettstown, N.J. 07840, assignor to Leo Gruna, Hackettstown, N.J.

Filed Jul. 20, 1983, Ser. No. 515,516

Int. Cl.⁴ B62D *25/02, 29/04*

U.S. Cl. 296—189 **8 Claims**



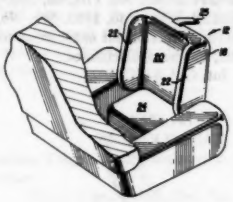
1. A crush resistant motor vehicle body comprising an inner shell of substantially incompressible material surrounding the vehicle, at least one layer of panels facing outwardly from the shell, adjoining panels having vertical edges overlapping in a horizontal direction outwardly from the inner shell, each panel having a plate of impact-resistant material on its shell face, an outer skin adapted to receive a paint finish, and impact-absorbing material occupying the space therebetween and means affixing said panels to said inner shell so as to permit removal and replacement of individual panels.

4,555,135

BUILT-IN CHILD'S SAFETY SEAT FOR VEHICLES

Verne L. Freeland, Box 693652, Miami, Fla. 33169

Filed Feb. 28, 1984, Ser. No. 584,402
Int. Cl.[4] A47C *13/00*
U.S. Cl. 297—105 6 Claims



1. A vehicle seat combined with a child's safety seat, comprising:

a first vehicle seat;

a first back rest mounted to the rear end of the first seat;

a child's seat mounted within an opening in the first vehicle seat and having a sitting surface recessed from the sitting surface of the first vehicle seat; and

a second back rest mounted at its lower end for pivotal movement only with respect to the forward end of the child's seat;

the second back rest being pivotable from a storable position overlaying said child's seat wherein a top surface thereof is substantially coplanar with the first seat thereby forming a continuation of the first seat to a usable position wherein the second back rest is substantially upright;

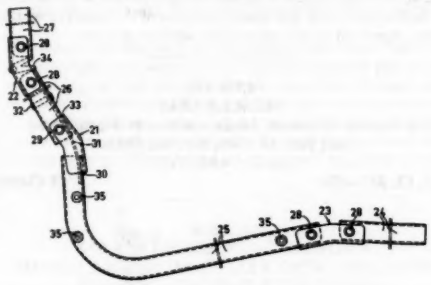
wherein said seat structure rotates in a direction away from the back-rest surface of said vehicle seat such that the child's seat user would face the rear of the vehicle.

4,555,136

FURNITURE CONSTRUCTION

Jan Dranger, 7, Carl Milles väg, S-181 34 Lidingö, Sweden

Filed Mar. 30, 1983, Ser. No. 480,435
Int. Cl.[4] A47C *7/36, 7/50*
U.S. Cl. 297—108 8 Claims



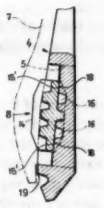
1. An article of furniture comprising a pair of vertical side members disposed in horizontally spaced relation to one another and interconnected to one another by a plurality of horizontal cross bars to form a stable ground engaging frame of fixed configuration, a pair of elongated side rods connected respectively to said pair of side members, said side rods being supported entirely by said frame in spaced relation to all of said cross bars and being free of any cross bars extending therebetween, each of said side rods including a generally horizontal seat rod portion which is connected to said frame, one end of said seat rod portion extending forwardly of said frame and being attached to a foot rest rod portion of said side rod, and the other end of said seat rod portion being smoothly curved upwardly to a generally vertically extending back rest rod portion, and an elongated unitary sheet of foldable support material connected along its opposing elongated edges to each of said rod portions of said pair of side rods respectively, said side rods forming together with said sheet of support material a generally horizontally extending seat, a foot rest at the front edge of said seat, and a back rest extending upwardly in a generally vertical direction from said smoothly curved rod portion adjacent the rear edge of said seat, said foot rest rod portion and seat rod portion of each of said side rods being separate rod portions which are interconnected to one another by a hinge adjacent said front edge of said seat, said hinges on said pair of side rods being operative to hold and support said foot rest in a first generally horizontal position wherein said foot rest extends away from said seat and outwardly of said ground engaging frame in freely spaced relation to the ground, said hinges also being operative to permit said foot rest to be pivoted to a second generally horizontal position wherein said foot rest overlies said seat, said ground engaging frame comprising the sole support of said article of furniture in all positions of said foot rest, all portions of said sheet of foldable material being held by said side rods above and in spaced relation to all of said horizontal cross bars at all times and in all positions of said foot rest, seat and back rest, and both opposing ends of each of said side rods being free ends which are freely spaced from the corresponding free ends of the other of said side rods and from both of said side members and all of said cross bars, said sheet of support material being free of engagement with any cross bar throughout the entire extent of said sheet between the opposing ends of said side rods, and the body of a user of said furniture article being free of engagement with any cross bar and in engagement with only said sheet of support material in all positions of said foot rest, seat and back rest.

4,555,137

BACK REST FOR A VEHICLE SEAT, PARTICULARLY A MOTOR VEHICLE SEAT

Walther Göldner, Denkendorf, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Jun. 20, 1983, Ser. No. 505,921
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222951
Int. Cl.[4] A47C *7/46*
U.S. Cl. 297—284 22 Claims



1. A back rest for a vehicle seat, comprising:

an upholstery support having a support surface;

a shaping body; and

upholstery supported by the upholstery support which has an adjustable longitudinal profile on a side facing a seat user, which profile is adjusted by the shaping body;

said shaping body having a first profile on a first abutment surface and a second profile on a second abutment surface;

said shaping body adapted to be placed selectively in defined positions between the upholstery support and the upholstery;

means in the support surface for selectively cooperating with the profiles of the abutment surfaces,

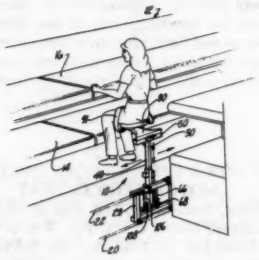
whereby when the first abutment surface contacts the support surface of the upholstery support, a first longitudinal profile is formed by the second abutment surface of the shaping body and the support surface and when the second abutment surface contacts the support surface of the upholstery support a second profile is formed by the first abutment surface of the shaping body and the support surface.

4,555,138

NURSE'S SEAT

Robert S. Hughes, Imlay City, Mich., assignor to R. S. Hughes Ind. Inc., Capac, Mich.

Filed Oct. 19, 1983, Ser. No. 543,393
Int. Cl.[4] B60N *1/08, 1/02*
U.S. Cl. 297—346 **4 Claims**



1. A nurse's seat for a vehicle having an elongated passageway with two sides and patient stations on both sides of said passageway comprising:

a pair of elongated tracks,

means for attaching said tracks along one side of the passageway so that said tracks are vertically spaced from each other,

a frame,

means for slidably mounting said frame to said tracks so that said frame is wholly positioned closely adjacent said tracks and said one side of the passageway, said frame having a vertically extending tube open at its top,

a seat assembly comprising an elongated support member, a lower end of said support member being telescopically received within said vertically extending tube, a plate having one end secured to an upper end of said support member, said plate having a second end positioned substantially centrally in said passageway, a seat, and means for swivelly mounting said seat to said second end of said plate,

means for selectively locking said frame to said tracks at a plurality of longitudinally spaced predetermined positions therealong,

means for selectively locking said seat assembly support member between a lowered position and a raised position,

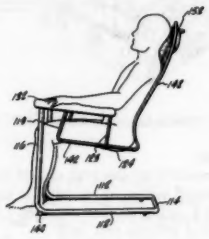
means for pivotally securing said plate to said support member for movement between an in use position and a storage position.

4,555,139

PATIENT'S DEFINED-MOTION CHAIR

Roger K. Leib, 1064 Crescent Heights Blvd., Los Angeles, Calif. 90053

Continuation-in-part of Ser. No. 368,521, Apr. 15, 1982, which is a continuation-in-part of Ser. No. 248,852, Mar. 30, 1981, which is a continuation-in-part of Ser. No. 110,340, Jan. 7, 1980, abandoned. This application Mar. 30, 1983, Ser. No. 480,357
The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.
Int. Cl.[4] A47C *3/02*
U.S. Cl. 297—460 **21 Claims**



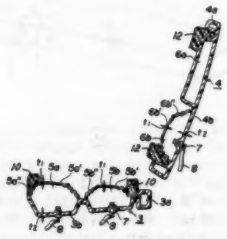
1. A chair capable of a lilting motion comprising a pair of spaced apart, parallel seat-supporting members and a pair of spaced apart, converging back-supporting members continuous and extending upwardly from the rear of the seat-supporting members, the seat-supporting and back-supporting members defining in elevation a seat and a back for the chair, the seat-supporting members and the back-supporting members being cantilevered rearwardly to deflect about a horizontal axis above the seat, the back-supporting members being generally S-shaped in elevation and having a lower section convex relative to the seat plane and an upper section concave relative to the seat plane, the convex section having a radius of curvature at its apex of from about 4 to about 7 inches and the concave section having a radius of curvature at its apex of from about 30 to about 50 inches, the apex of the convex section being from about 5 to about 8 inches above the seat plane and the apex of the concave section being from about 16 to about 21 inches above the seat plane, the apex of the concave section being rearward of the apex of the convex section.

4,555,140

VEHICLE SEAT

Akira Nemoto, Akishima, Japan, assignor to Japan, Japan

Filed Feb. 23, 1984, Ser. No. 583,033
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **6 Claims**



1. A vehicle seat frame of the type for supporting a cushion pad thereon comprising a bottom section and adjustment means integrally formed with said bottom section to permit for selective displacement adjustment of a portion of the pad

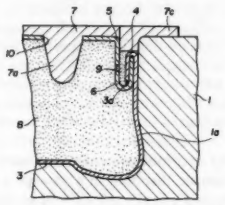
relative the bottom section of said seat frame, said adjustment means including a top wall and side walls integrally formed with one another and with said bottom section of the seat frame and together defining an interior closed hollow chamber, said side walls including means defining plural pleated portions for permitting expansion and contraction of said chamber in response to introduction and exhaustion of a pressurized fluid into and from said chamber, respectively, to displace said top wall relative said bottom section which, in turn, is capable of displacing the pad portion to selectively adjust the same.

4,555,141

VEHICLE SEAT

Akira Nemoto, Tokyo, Japan, assignor to Tachikawa Spring Co. Ltd., Japan

Filed Aug. 5, 1983, Ser. No. 520,644
Int. Cl.⁴ A47C 7/02
U.S. Cl. 297—452 **11 Claims**



1. A vehicle seat comprising:

a frame including a bottom wall and a peripheral wall integral with said bottom wall, said peripheral wall including means defining an exterior recessed insertion portion adjacent said peripheral wall;

a top layer having its peripheral edge inserted into said exterior recessed insertion portion, said top layer also defining, together with said interior area of said frame, an interior pad space;

said peripheral wall also including means defining plural apertures to establish communication between said interior pad space and said exterior recessed insertion portion; and

a foamed pad disposed in said interior pad space between said frame and said top layer, portions of said pad in the vicinity of said peripheral wall extending through said apertures defined therein and into said exterior recessed insertion portion, said pad portions extending into said recessed insertion portion also being in contact with said top layer peripheral edge to secure said top layer to said frame.

4,555,142

SUPPLY OF LIQUID MEDIA FOR A HYDRAULIC-MECHANICALLY OPERATING MINE WORKING MACHINE WITH SWORD

Joachim Holz, Dortmund; Wolfgang Meier, Oer-Erkenschwick; Karl-Heinz Schwarting, Voerde; Heinrich Goris, Hamminkeln, and Kurt Ogorek, Oberhausen, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

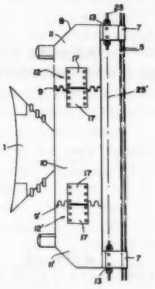
Filed Dec. 9, 1983, Ser. No. 559,764
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245792
Int. Cl.⁴ E21C 35/12, 35/22
U.S. Cl. 299—43 **8 Claims**

1. A mine apparatus for use with a longwall conveyor having a stowing side facing away from a longwall to be mined, comprising:

a working machine (1) movable along a longwall (50) and having a sword (8) with a first part (10) carrying cutting tools to cut the longwall, and at least one second part (11) having a tractor hookup block (14) with a plurality of bores (15) therein for supplying high pressure liquid medium to said cutting tools for cutting and control purposes, said first and second part being shaped to receive a longwall conveyor thereon and being connected to each other for relative movement therebetween;

duct means defining separate upper and lower tractor ducts (3, 3') and a drag line duct (4) extending parallel to each other and at a stowing side of a longwall conveyor, said duct means including a slot (52) communicating said drag line duct with said lower tractor duct, said tractor hookup block being movable in said lower tractor duct;

tractor means (13,25) movable in said lower tractor duct and



connected to said tractor hookup block for pulling said tractor hookup block and said sword back and forth along the longwall;

a hose hookup (7) which is separate from said tractor hookup block (14), fixedly connected to said tractor hookup block, said hose hookup block movable in said drag line duct (4) and extending through said slot for connection to said tractor hookup block, said hose hookup block having a plurality of bores (15) communicating respectively with said bores of said tractor hookup block; and

a plurality of high pressure liquid media carrying lines (5) connected to said hose hookup block (7) and movable in and confined by said drag line duct for supplying high pressure liquid media to said bores and to said cutting tools for cutting and control purposes.

4,555,143

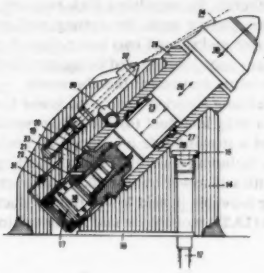
APPARATUS FOR CUTTING ROCK

Herwig Wrulich; Otto Schetina, both of Zeltweg; Gottfried Siebenhofer, Fohnsdorf, and Wilfried Maier, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Mar. 29, 1984, Ser. No. 594,524
Claims priority, application Austria, Apr. 11, 1983, 1281/83
Int. Cl.⁴ E21C 35/22, 37/06
U.S. Cl. 299—81 **13 Claims**

1. A cutting assembly for a rock cutting machine comprising; a bit shaft inserted into and supported by a bit holder capable of limited axial movement; a valve positioned coaxially

with the bit shaft whereby an axial cutting pressure on the bit shaft tends to open the valve; a means to intermittently supply



fluid pressure to the valve thereby exerting an axial force on the bit shaft to urge the bit shaft against the cutting pressure.

4,555,144

METHOD AND APPARATUS FOR CONTROLLING AND MONITORING HYDRAULIC BRAKE SLIP

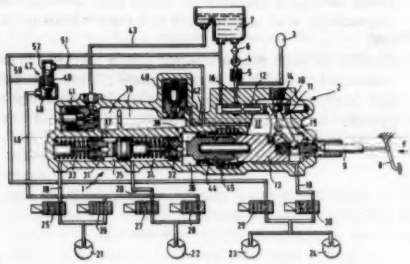
Juan Belart, Walldorf; Jochen Burgdorf, Offenbach; Dieter Kircher, Frankfurt am Main; Hans-Wilhelm Bleckmann, Obermoerlen, and Lutz Weise, Mainz, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,501

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232052

Int. Cl.⁴ B60T *8/02, 8/04*

U.S. Cl. 303—92 **16 Claims**



1. A method for controlling and monitoring brake slip control devices for a vehicle hydraulic braking system having a plurality of brake wheel cylinders, comprising the steps of:

introducing braking pressure into said brake wheel cylinders energizable from an external source, said pressure being transmitted via at least one static brake circuit and one dynamic brake circuit;

controlling a fluid flow return from static brake circuit in reaction to pressure differential between said return and dynamic circuit fluid pressures;

said controlling being capable of carrying out and operating despite the failure of brake valve inner elements to operate and while said external source maintaining continues supply of fluid flow to said dynamic brake circuit.

4,555,145

ANTI-LOCK SYSTEM FOR VEHICLES

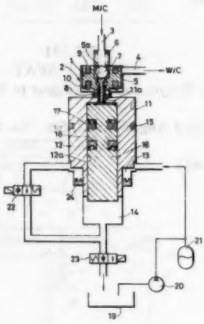
Toshifumi Maehara, Hanazono, and Hiroyuki Yoshizawa, Hasuda, both of Japan, assignors to Akebono Brake Industry Company Ltd., Japan

Filed May 23, 1984, Ser. No. 613,378

Claims priority, application Japan, May 24, 1983, 58-91209

Int. Cl.⁴ B60T *17/18*

U.S. Cl. 303—92 **3 Claims**



1. A vehicular anti-lock system comprising:

a valve mechanism disposed in a passage connecting a master cylinder and a brake system and including a valve seat member made movable in a valve chamber, a valve seat formed on said valve seat member, and a valve member made engageable with said valve seat;

a fail-safe piston made movable in a cylinder and having its one end engaging with said valve seat member and its other end connected with a liquid pressure source which is independent of said master cylinder;

a control piston made movable in said fail-safe piston and having its one end operationally engaging with said valve member and subjected to the pressure of said brake system and its other end facing a control chamber;

a first valve connected between said liquid pressure source and said control chamber and adapted to be closed in response to a brake releasing signal;

a second valve connected between said control chamber and a reservoir and adapted to be opened in response to said brake releasing signal; and

a bypass passage disposed in parallel with said valve mechanism and adapted to be closed when said fail-safe piston is caused to bring said valve seat member into engagement with the wall of said valve chamber by the pressure of said liquid pressure source.

4,555,146

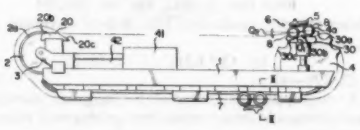
TRACK-TYPE VEHICLE UNDERCARRIAGE

Yukio Tamura, and Masashi Kaminishi, both of Hiratsuka, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,510

Int. Cl.⁴ B62D *55/12*

U.S. Cl. 305—10 **3 Claims**



1. A track-type vehicle undercarriage, comprising:

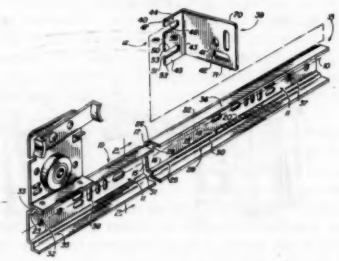
(a) a track frame;
(b) recoil means mounted on said track frame, said recoil means having a piston slidabley mounted therein and means for biasing said piston forwardly;
(c) a support member fixedly connected at its rearward end to said piston;
(d) an idler rotatably mounted on said support member at the forward end thereof;
(e) a sprocket rotatably mounted on the rear of said track frame;
(f) a lower rail mounted on said track frame underneath thereof, said track frame having a front end terminating adjacent and below said idler and a rear end terminating adjacent and below said sprocket, both ends of said lower rail being upwardly curved;
(g) an endless track of linked together track shoes mounted around said idler, said sprocket and said lower rail;
(h) a front support rail vertically, movably mounted on said support member adjacent to said idler, said front support rail having a flat top surface positioned slightly below the uppermost point of said idler and a downwardly inclined rear top surface to permit a smooth travel of said endless track when advancing the vehicle forwardly; and
(i) a rear support rail resiliently mounted on said track frame adjacent to said sprocket, said rear support rail having a flat top surface positioned slightly below the uppermost point of said sprocket and a dowanwardly inclined front top surface to permit a smooth travel of said endless track when advancing the vehicle rearwardly.

4,555,147

DRAWER SLIDE MOUNTING BRACKET

David L. Jackson, 4025 E. Madison, Phoenix, Ariz. 85034

Filed Sep. 6, 1984, Ser. No. 647,921
Int. Cl.[4] F16C *29/00*
U.S. Cl. 308—3.8 **2 Claims**



1. In combination with the mounting rail of either of a pair of drawer rail assemblies, said mounting rail of each of said drawer rail assemblies having a rear end and including
an elongate panel having
planar front and back surfaces,
a longitudinal axis, and
a pair of opposed edges generally parallel to one another and said longitudinal axis, the shortest distance between said opposed edges being different for each of said drawer rail assemblies,
first and second opposed flanges attached to said elongate panel along said edges thereof and outwardly extending from said front surface thereof, said flanges each having generally planar parallel upper and lower surfaces, and an outer edge spaced away from and
generally parallel to said elongate panel, the shortest distance between said upper and lower planar surfaces of each of said first and second flanges comprising the thickness of each flange, third and fourth flanges each attached to one of said outer edges of said first and second flanges, said third and fourth flanges
each having generally planar parallel forward and rear surfaces generally parallel to said elongate panel, and
extending outwardly away from said first and second flanges and said panel member,
said rear surfaces of said third and fourth flanges generally lying in the same imaginary plane, an imaginary plane passing through said front surface of said elongate panel being generally parallel to and spaced apart from said imaginary plane passing through said rear surfaces of said third and fourth flanges,
said elongate panel and first, second, third and fourth flanges terminating at said rear end of said mounting rail,
a one piece mounting bracket for slidably frictionally engaging and supporting said mounting rail and including a mount plate for cabinet attachment and a toothed panel to slidably frictionally interfit with said drawer rail assembly mounting rail, said toothed panel being integrally joined with said mounting plate along a generally linear juncture and having a mounting rail receiving end spaced away from said linear juncture and including
(a) a first tooth having front and back planar surfaces and upper and lower generally linear peripheral edges;
(b) a second tooth having front and back planar surfaces and upper and lower generally linear peripheral edges;
(c) a tongue between said first and second teeth and having front and back planar surfaces and upper and lower generally linear peripheral edges;
said lower peripheral edge of said first tooth and upper peripheral edge of said tongue generally being parallel and defining a first slot through said toothed panel opening at said mounting rail receiving end thereof, the shortest distance between said lower peripheral edge of said first tooth and said upper peripheral edge of said tongue being greater than said thickness of said first flange,
said upper peripheral edge of said second tooth and said lower peripheral edge of said tongue being generally parallel and defining a second slot through said toothed panel opening at said mounting rail receiving end thereof, the shortest distance between said upper peripheral edge of said second tooth and said lower peripheral edge of said tongue being greater than said thickness of said second flange,
said mounting bracket being sized and dimensioned such that when said rear end of one of said mounting rails engages said mounting rail receiving end of and slidably frictionally interfits with said mount bracket,
(d) said back planar surface of said tongue contacts said front planar surface of said elongate panel of said mounting rail; and,
(e) said front planar surfaces of said first and second teeth contact said rear surfaces of said third and fourth flanges.

4,555,148

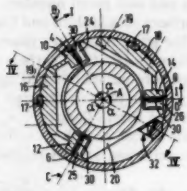
RECTILINEAR GUIDE COMPRISING FIRST AND SECOND MEMBERS WHICH ARE MOVABLE ONE WITHIN THE OTHER

Hans C. de Willigen, and Johannes E. Kokken, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 28, 1984, Ser. No. 675,683
Claims priority, application Netherlands, Dec. 1, 1983, 8304140
Int. Cl.[4] F16C *29/04, 29/12*
U.S. Cl. 308—6 R **3 Claims**

1. A rectilinear guide comprising first and second members arranged one within the other and of which one is movable rectilinearly relative to the other, the two members having coinciding central axes extending in the direction of the relative movement between the members, and at least two clusters of bearing elements which are arranged between said members, the clusters being spaced from one another in the direc-

tion of said axes and at least one of the members comprising guide surfaces which extend in the direction of said axes and on



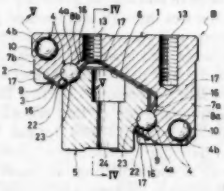
which the bearing elements are movable, characterized in that the guide surfaces are situated in planes which contain said coinciding axes.

4,555,149

LINEAR SLIDE BEARING AND LINEAR SLIDE TABLE USING THIS BEARING

Hiroshi Teramachi, 34-8, Higashi-Tamagawa 2-chome, Setagaya-ku, Tokyo 158, Japan

Filed Sep. 1, 1983, Ser. No. 528,588
Claims priority, application Japan, Sep. 20, 1982, 57-162113
Int. Cl.[4] F16C *29/06*
U.S. Cl. 308—6 C **14 Claims**



1. A linear slide bearing comprising:

a slide block of substantially C-shaped cross section having a obliquely downward opened recess defined between arms thereof, one of the arms having an upwardly facing inclined surface on the inner side thereof, the other arm having a downwardly facing inclined surface on the inner side thereof, the upwardly and downwardly facing inclined surfaces each having only a single load ball groove semicircular in cross section extending longitudinally thereon, the load ball groove in one of said arms being positioned such that there is clear access thereto, for grinding purposes, with respect to the other of said arms, from a direction generally perpendicular to a chord drawn across the edges of said load ball groove, and the load ball groove of the other of said arms being positioned such that there is clear access thereto, for grinding purposes, with respect to said one arm, and each of said arms further having no-load ball hole bored longitudinally therethrough;

a pair of side covers attached to right and left side surfaces of said slide block, each side cover having guide grooves each interconnecting both end portions of the load ball groove and the no-load ball hole formed in each arm;

a ball retainer formed from a thin plate material into a shape substantially conforming to the recess of said slide block, said ball retainer having a downwardly facing inclined surface and an upwardly facing inclined surface, facing the upwardly and downwardly facing inclined surfaces formed on both arms of said slide block respectively, said downwardly end upwardly facing inclined surfaces having slots confronting their mating load ball grooves formed in said upwardly and downwardly facing inclined surfaces respectively, said ball retainer being mounted in the recess of said slide block, with both end portions thereof secured by said pair of side covers respectively;

a large number of balls running through endless tracks formed by the load ball grooves and the no-load ball holes formed in the arms of said slide block and the guide grooves in said pair of side covers interconnecting both end portions of these grooves and holes respectively, the balls forming load-carrying ball trains running through said load ball grooves while partly projecting from the slots in said ball retainer and no-load ball trains running through said no-load ball holes; and

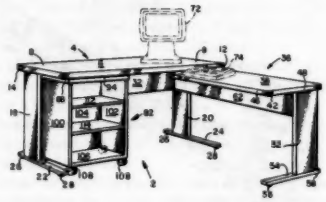
a guide rail having at least the upper portion thereof formed into a shape substantially similar in cross section to that of the recess of said slide block, said guide rail further having a downwardly facing inclined surface and an upwardly facing inclined surface, facing the upwardly and downwardly inclined surfaces of said slide block respectively, said downwardly and upwardly facing inclined surfaces having ball-rotating grooves semicircular in cross section through which the balls forming the load-carrying ball trains and partly projecting from the respective slots in said ball retainer run.

4,555,150

WORK STATION

Clyde D. Turnbull, Chicago, Ill., assignor to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Jan. 16, 1984, Ser. No. 570,948
Int. Cl.[4] A47B *83/04*
U.S. Cl. 312—250 **4 Claims**



1. A work station comprising:

a first table having a substantially rectangular top with upper and lower surfaces and means for supporting the top adjacent the ends of the top,

a second table having one end secured to the first table at a substantially right angle thereto having a substantially rectangular top with upper and lower surfaces and with the rear edge of the second table top being substantially aligned with the edge of one end of the first table top, and the upper surface of the second table top lying in a plane below the plane of the lower surface of the first table top, and

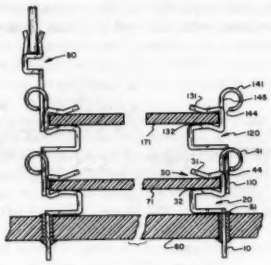
a movable storage cabinet having a top which has a height substantially equal to the height of said second table top and a depth substantially equal to the depth of the second table top respectively for alternatively serving as an extension of the second table by positioning the storage cabinet so it is adjacent to the end of the second table top opposite the end that is secured to the first table or nesting under the first table top adjacent the end thereof remote from the second table.

4,555,151

CONTACT TERMINAL DEVICE FOR CONNECTING HYBRID CIRCUIT MODULES TO A PRINTED CIRCUIT BOARD

Wayne E. Neese, Hoffman Estates, and William E. Stepan, Clarendon Hills, both of Ill., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Aug. 6, 1984, Ser. No. 638,174
Int. Cl.⁴ H01R *23/72*
U.S. Cl. 339—17 CF **4 Claims**



1. A contact terminal device for electrically interconnecting and physically attaching at least first and second planar hybrid circuit modules in a stacked and substantially parallel relationship to the other and to a printed circuit board connected to a source of electrical signals, said contact terminal device comprising:

male terminal means arranged to be accepted and electrically connected to said printed circuit board and said source of electrical signals;

a buffer means including first and second legs and having said first leg extending from said male terminal means;

accepting means including a resilient tongue section and a rigid vertically oriented surface extending from said buffer means second leg forming a compliant mouth for accepting an edge of said first hybrid circuit module therein, electrically connecting said first hybrid circuit module to said printed circuit board and said source of electrical signals; and,

connecting means comprising first and second open-ended loops of conductive material spaced parallel to each other and having one end of each of said first and second loops extending from a top edge of said accepting means surface, each of said first and second loops connected to the other's opposite end by a horizontal member defining a male terminal accepting area between the front edge of said horizontal member and a rear side of said accepting means surface, the male terminal means of a second contact terminal device installed on said second hybrid module is inserted between said first and second loops, and said horizontal member front edge applies a compressive force against said male terminal means of said second terminal device thereby, retaining said second hybrid circuit module to said first hybrid circuit module in a stacked and parallel relationship, connecting said second hybrid module to said printed circuit board and said source of electrical signals.

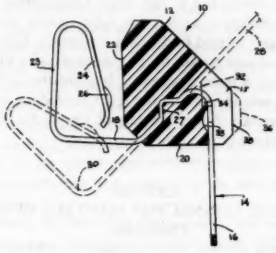
4,555,152

LEADLESS INTEGRATED CIRCUIT CONNECTOR

Donald L. Johnson, Olivenhain, and Lowell R. Lingenfelter, La Jolla, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 26, 1983, Ser. No. 535,849
Int. Cl.⁴ H01R *23/70*
U.S. Cl. 339—17 L **3 Claims**

1. A device for connecting a leadless flat circuit to a circuit board comprising an elongated body of insulating material having a first surface adapted to fit flush against a circuit board, a second surface adjacent the first surface having a series of parallel grooves, and a third surface; and a series of parallel conductors each molded into a central portion of the body of insulating material and bent to fit into one of the grooves in a manner that the insulating material underlying the bend is forced tightly thereagainst and the portion of the body which is grooved is forced tightly against the remaining portion of the conductor, the conductors protruding at one end



from the first surface for connection to a circuit board and at the other end lying alongside the third surface and being bent to provide a spring to hold and make contact with the leadless flat circuit interposed between the conductors and the third surface, and

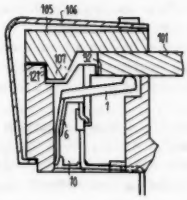
in which each of the parallel conductors has a portion adjacent the end lying alongside the third surface which lies in the same plane as the first surface when the leadless flat circuit is held in place against the third surface.

4,555,153

CONNECTOR COMPRISING AT LEAST ONE CONTACT HAVING A RESILIENTLY DEFORMABLE ARM

Hervé Bricaud, Plaisir, and Patrick L'Henaff, Thiais, both of France, assignors to Socapex, Suresnes, France

Filed Feb. 21, 1984, Ser. No. 581,709
Claims priority, application France, Feb. 25, 1983, 83 03131
Int. Cl.⁴ H01R *23/72*
U.S. Cl. 339—17 CF **25 Claims**



1. In a connector comprising at least one contact having a resiliently deformable arm exterting a bearing force in the direction opposite the direction of insertion of a substantially planar substrate having contact pads on the planar surface facing said insertion direction, said contact being inserted longitudinally substantially parallel to the direction of insertion of said substrate in a socket formed in an insulating block, said contact having longitudinal generatrices, and comprising: a body cooperating with at least one edge of the socket so that, once the contact has been inserted, it has a longitudinal axis essentially parallel to the direction of the generatrices of the socket; said body having in section the general shape of a U defined by a bottom and two substantially planar legs, at least one of the legs being guided longitudinally over at least a part

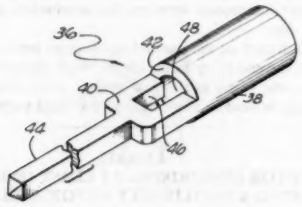
of its length by at least one lateral wall of the socket; an output terminal disposed at one longitudinal end of the body of the contact and extending from said socket; an extension forming an abutment for the contact against a surface of said insulating block to limit movement of the contact in the direction of insertion of the contact; a resilient retention tongue connected to said body, extending essentially in the longitudinal direction of said body, and cooperating with a stopping face of a retention cavity disposed in said socket so as to form an abutment in the direction opposite the direction of insertion of the contact; a spring arm connected to the other longitudinal end of said body and extending in a direction substantially parallel to the longitudinal axis of said body; said resiliently deformable arm extending from said socket for engagement with said substrate and comprising a lever projecting beyond the socket and extending from said spring arm the lever extending in a direction that is substantialy from one leg of the body towards and through the plane of the other leg.

4,555,154

ELECTRICAL CONNECTOR CONTACT RETENTION ASSEMBLY

John A. Sugars, Ogden, Utah, assignor to International Telephone & Telegraph Corp., New York, N.Y.

Filed Dec. 21, 1983, Ser. No. 563,855
Int. Cl.⁴ H01R *11/00*
U.S. Cl. 339—59 R **8 Claims**



1. An electrical connector member comprising:
an insulator having at least one passage extending therethrough from a front face to a rear face thereof;
an electrical socket contact in said passage insertable therein from the front of said insulator;
said socket contact having a forward hollow section and a rear section;
said forward hollow section of said contact having a close sliding fit within said passage;
said forward section having a bore therethrough communicating with an opening in said rear section;
the rear of said opening providing a forwardly facing shoulder;
a laterally movable contact retention element extending rearwardly and inwardly from the wall of said passage, the end of said retention element engaging said shoulder for restricting forward movement of said contact in said passage; and
said retention element being deflected outwardly to remove said end thereof out of engagement with said shoulder by inserting a tool from the front of said insulator rearwardly through said bore into said opening.

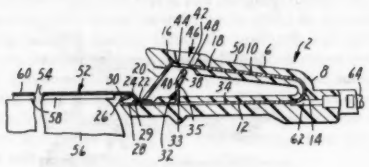
4,555,155

BIOELECTRODE CONNECTOR

Gerald E. Drake, Menomonie, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 28, 1983, Ser. No. 555,643
Int. Cl.⁴ H01R *9/07*
U.S. Cl. 339—61 R **2 Claims**

1. A bioelectrode connector adapted for connection with a monitoring electrode having a thin, conductive, deformable tab comprising generally parallel first and second major surfaces, the connector comprising:
a. an elongate first member having an end portion terminating at a generally transverse, plane edge surface;
b. an elongate, electrically conductive second member having a contact surface and an arcuate end portion extending from the contact surface and terminating at a generally transverse, plane edge surface overlying and spaced apart from the contact surface;
c. means for attaching the members opposite the end portions to afford relative movement of the end portions generally perpendicular to the contact surface from an open position with the end portions spaced apart to a



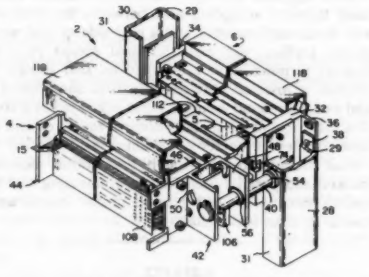
closed position with the edge surface of the first member pinning the tab into intimate engagement with the contact surface and bending a portion of the tab adjacent the edge surface of the first member into close proximity with the edge surface of the second member;
d. means for biasing the end portions in the open position to afford insertion of the tab therebetween; and
e. means for releasably latching the end portions in the closed position, comprising a latch having a first end portion connected to the second member and a second end portion including means for contacting the first member when the end portion of the first member is in the closed position and for locking the end portion of the first member in the closed position.

4,555,156

ELECTRICAL CONNECTOR ASSEMBLY HAVING MATING AND UNMATING REMOVABLE KEYS

Friedrich J. A. Kourimsky, Bensheim, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 16, 1984, Ser. No. 672,051
Int. Cl.⁴ H01R *13/629*
U.S. Cl. 339—75 M **10 Claims**



1. A multi-contact electrical connector assembly of the type comprising two connector parts, each of the parts comprising a housing assembly having contact terminals therein, each housing assembly having a mating face, oppositely facing endwalls and oppositely facing sidewalls, the endwalls and the sidewalls extending substantially perpendicularly of the mating face, the contact terminals in each housing assembly having a

contact portion which is adjacent to the mating face, the contact terminals being of the type which are mated with each other by moving the terminals axially towards each other until the contact portions are in aligned overlapping and axially offset relationship and then moving the contacts laterally of their axis in a first lateral direction towards each other, the contact terminals being disengageable by moving the terminals laterally of their axes in a second lateral direction which is the opposite direction from the first lateral direction and then moving the terminals parallel to their axes away from each other, the connector assembly being characterized in that:

a connector assembly guide means is provided on the housing assemblies for guiding the assemblies towards each other from a spaced-apart position to a closed portion in which the mating faces are substantially against each other and the contact portions of the terminals are in overlapping offset relationship,

first and second camming systems are provided for moving the housing assemblies in the first and second lateral directions respectively, the first camming system being incapable of moving the housing assemblies in the second lateral direction, the second camming system being incapable of moving the housing assemblies in the first lateral direction,

the first and second camming systems being independent of each other, at least one of the camming

systems having a readily removable camming part which,

upon removal, immobilizes the one camming system whereby, upon removal of the one removable camming part, the housing assemblies cannot be moved in one of the lateral directions.

4,555,157

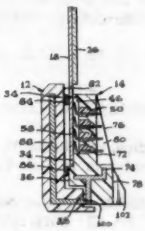
ELECTRICAL CONNECTOR FOR VISUAL DISPLAY AND METHOD OF MAKING SAME

Donald L. Johnson, Olivenhain, and Thomas F. Kordis, Solana Beach, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 410,938, Aug. 24, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 647,118

Int. Cl.[4] H05K *1/00*; H01R *13/62*

U.S. Cl. 339—75 MP **12 Claims**



1. An electrical connector for making electrical connections to a generally rectangular large-area substrate having a plurality of spaced-apart contact pads arranged in parallel rows along the edges on one surface of the substrate and positioned with respect to substrate index means provided on a first end of the substrate, comprising:

a base in the form of a generally rectangular frame each side of which includes a support surface for supporting a respective edge on the one surface of the substrate, and having multiple rows of cavities formed below the support surface along each side of the base, each row including a plurality of spaced-apart cavities;

a plurality of generally rectangular contact assemblies, each including an insulator body for supporting multiple spaced-apart electrically conductive elements positioned to form a row of resilient electrical contacts which project from a first surface of the assembly body, and a row of corresponding electrical terminals which project from a second surface of the assembly body, each contact assembly body designed to be removably insertable within a respective one of the cavities so that the electrical contacts extend in multiple rows adjacent the support surface on each side of the base;

alignment means including a contact assembly alignment element formed as part of each contact assembly body and a cavity alignment element formed as part of each cavity for both aligning and retaining each contact assembly in the respective cavity so that the electrical contacts are maintained in aligned relation to the base;

registration means formed as part of the base for positioning the substrate with respect to the electrical contacts so that the substrate contact pads are aligned with the electrical contacts when the substrate is placed onto the base;

a cover in the form of a generally rectangular frame designed to fit over the edges on the other side of the substrate and to fasten to the base, and having means for applying pressure to the edges on the other surface of the substrate to maintain connection between the contact pads and the electrical contacts;

fastening means for fastening the cover to the base; and

in which the base further comprises base stiffening means including base stiffening bars, each bar embedded in and extending substantially the length of each side of the base and formed of a material sufficiently stiff to prevent the sides of the base from bending when the cover is fastened to the base.

4,555,158

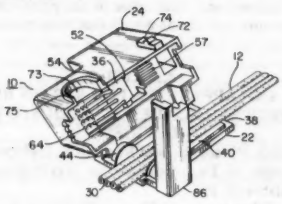
MODULAR CONNECTOR AND SYSTEM CONTAINING THE SAME

Ping H. Lam, Baguio Villa, Hong Kong, assignor to The Wallace Companies, Inc., Birmingham, Ala.

Continuation-in-part of Ser. No. 638,021, Aug. 6, 1984. This application Mar. 18, 1985, Ser. No. 712,620

Int. Cl.[4] H01R *4/24*

U.S. Cl. 339—99 R **25 Claims**



1. A modular connector adapted to provide a removable electric connection between a source of electricity and electrical equipment, comprising:

(a) a base;

(b) a pathway on a surface of the base for receiving an insulated cable containing at least one conductor therein;

(c) a cover operatively connected and movable relative to the base, comprising an opening for receiving an electrical connector insertable therein, insulation piercing means, and electrical connecting means between said opening and said insulation piercing means adapted to electrically connect a pierced cable to an electrical connector inserted in said opening, said cover being movable from an open position exposing said base to a closed position for aligning said insulation piercing means with said insulated cable;

(d) a cam mounted to said base including an essentially planar surface which is alignable with said pathway to facilitate reception of the insulated cable, and a non-planar surface comprising at least one groove which surface is raised relative to said pathway for moving said cable

toward said insulation piercing means when said cover is moved from the open position to the closed position to facilitate piercing thereof; and

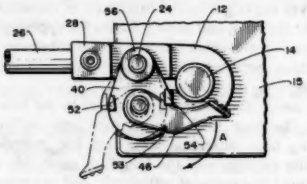
(e) means for moving said essentially planar surface out of alignment with said pathway and moving said non-planar surface adjacent said pathway.

4,555,159

BATTERY POST CONNECTOR

Armand N. Chartrain, 115 Poinsettia Gardens, Ventura, Calif. 93004, and Lee A. Genne, 1220 Johnson Dr., No. 111, Ventura, Calif. 93003

Filed Aug. 6, 1984, Ser. No. 638,276
Int. Cl.[4] H01R *11/26*
U.S. Cl. 339—239 **14 Claims**



1. A battery post connector comprising:

a conductor clamp having spaced-apart first and second legs each having an upstanding post;

a pivot member rotatably connected to one of said posts having a central opening into which the other of said posts extends;

a lever having a boss extending therefrom for rotatable interfitting with the central opening, the rotational axis of said boss being coextensive with the axis of said central opening; and

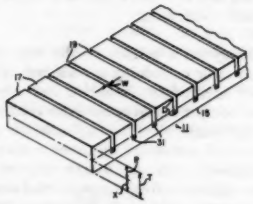
an aperture through said boss having an axis offset from the boss rotational axis, said other of the posts extending into said aperture and about which the lever rotates.

4,555,160

METHOD AND APPARATUS FOR STRAIN RELIEVING TRANSDUCERS BONDED TO ACOUSTO-OPTIC DEVICES

Milton Gottlieb, Pittsburgh, and Kenneth B. Steinbruegge, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 2, 1982, Ser. No. 403,954
Int. Cl.[4] G02F *1/33*
U.S. Cl. 350—358 **3 Claims**



1. A method of bonding a single acoustic transducer plate to an optical medium to form an acousto-optic device having at least two separate transducer elements, said single acoustic transducer plate having a first surface which is to be bonded to said optical medium and a second exposed surface opposite thereto, said method comprising the steps of:

forming at least one groove of predetermined depth in the first surface of the transducer plate whereby the first surface consists of at least two spaced mounting zones separated by said at least one groove;

bonding said transducer plate mounting zones of said first surface to the optical medium;

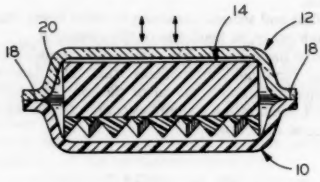
polishing the second exposed surface of said bonded transducer plate in order to reduce the transducer plate to a thickness which is less than the predetermined depth of said grooves in order to expose said grooves thereby rendering at least two separated transducer elements bonded to the optical medium.

4,555,161

ENCAPSULATED RETROREFLECTIVE MATERIAL AND METHOD OF MAKING SAME

William P. Rowland, Southington, Conn., assignor to Reflexite Corporation, New Britain, Conn.

Filed Feb. 16, 1984, Ser. No. 580,736
Int. Cl.[4] G02B *5/124*
U.S. Cl. 350—103 **10 Claims**



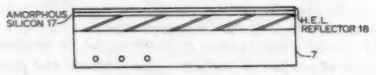
1. A retroreflective laminar sheet assembly comprised of a first length of flexible synthetic plastic sheet material providing a base sheet, a substantially coextensive length of flexible transparent synthetic plastic sheet material providing a cover sheet, and an array of retroreflective film pieces disposed between said base sheet and cover sheet along the length thereof in a predetermined pattern for retroreflectance through said cover sheet, said base and cover sheets being bonded to one another in the areas between and about said film pieces to provide a multiplicity of discrete cells in which said film pieces are seated.

4,555,162

METHOD OF FABRICATING LONG PERIOD OPTICAL GRATING

Ralph E. Aldrich, Acton, and Steven M. Daigneault, Rockland, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Mar. 5, 1984, Ser. No. 586,175
Int. Cl.[4] G02B *5/18*
U.S. Cl. 350—162.17 **19 Claims**



1. A method of fabricating a long period optical grating device comprising the steps of:

providing a plurality of support elements having planar surfaces;

producing light reflective surfaces upon the planar surfaces of said support elements;

thereafter bonding said support elements together in a stack; and

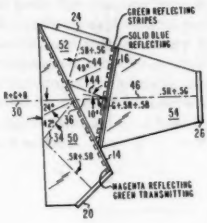
thereafter cutting said stack at an acute angle with respect to the planar surfaces of said support elements and lapping said stack to form said grating.

4,555,163

COMPLEMENTARY COLOR SPLITTING FILTERS USED IN A COLOR CAMERA

Theodor M. Wagner, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 22, 1983, Ser. No. 534,710
Int. Cl.[4] G02B *27/10, 5/28;* H04N *9/09*
U.S. Cl. 350—172 **10 Claims**



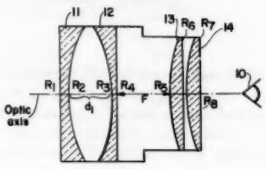
1. A color television beam splitter for use with incident light including first, second and third primary color components comprising a first partially reflecting means having first areas for transmitting all of said incident light components along a path and second areas for reflecting all of a first group of two of said three primary color components corresponding to a first color complementary to said first primary color component to a first output port; and a second partially reflecting means disposed in said path and having first areas for transmitting all of a second group of two of said three primary color components corresponding to a second color complementary to said second primary color component to a second output port and second areas for reflecting all of a third group of two of said three primary color components corresponding to a third color complementary to said third primary color component to a third output port.

4,555,164

ANAMORPHIC LENS SYSTEM INCREASING THE FIELD OF VIEW FOR THE VISUALLY HANDICAPPED

William Feinbloom, Highland, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,765
Int. Cl.[4] G02B *27/02, 13/00*
U.S. Cl. 350—420 **13 Claims**



1. A lens assembly for increasing the field of vision of a user having a visual handicap indicative of a condition designated as tunnel vision, said lens assembly operative to increase the field of view by minifying optically in one plane, while substantially not altering the magnification or minification in another plane transverse to said one plane, comprising:

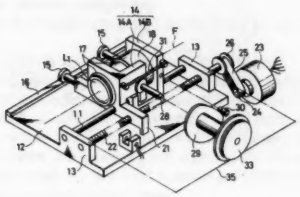
a first lens assembly being a cylindrical concave lens assembly including a first plano-concave lens having a front flat surface of an infinite radius and a second concave surface, with a second plano-concave lens assembly having its concave surface facing said concave surface of said first lens and aligned on the same optical axis positioned at a given distance from the eye of said user with a second lens assembly being a cylindrical convex lens assembly including a first plano-convex lens having its convex surface facing the flat surface of said second plano-concave lens, with a second plano-convex lens having its convex surface facing the flat surface of said first plano-convex lens, with all of said lenses aligned with their centers on a common optical axis positioned between said first assembly and the eye of said user to enable said user to perceive with almost no reduction of his own acuity in said one plane and with a minification proporational to the increase in said field of view, in said other plane transverse to said one plane.

4,555,165

ZOOM LENS BARREL FOR VARIABLE MAGNIFICATION TYPE COPYING MACHINE

Ikuo Negoro, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,576
Claims priority, application Japan, Oct. 3, 1983, 58-186084
Int. Cl.[4] G02B *7/11;* G03B *27/10*
U.S. Cl. 350—429 **4 Claims**



1. In a variable magnification type copying machine in which a zoom lens having at least two movable lenses is arranged between an original surface and a photosensitive surface, and the positions of said movable lenses and the distance between said movable lenses are changed to vary the copying magnification thereof, the improvement wherein:

said movable lenses of said zoom lens are fixedly held by respective movable lens frames,

said movable lens frames are inserted into an axial hole formed in a single movable lens barrel which is moved in the axial direction as the magnification of said zoom lens is varied,

at least one of said movable lens frames is fixedly secured to said movable lens barrel, while the other movable lens frame is supported in said movable lens barrel in such a manner as to be moved in the axial direction as the magnification changes, and

said one movable lens frame comprises first means for adjusting an angular position of said one movable lens frame with respect to said movable lens barrel without moving said one movable lens frame in the axial direction, and second means for adjusting a position of said one movable lens frame in an axial direction thereof.

4,555,166

ELECTRIC REMOTE CONTROL MIRROR WITH HALF-BALL PORTION

Masao Enomoto, Isehara, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

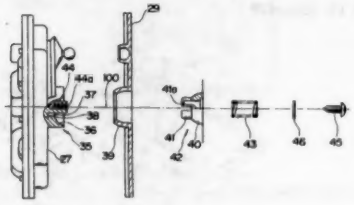
Filed Apr. 30, 1982, Ser. No. 373,783
Claims priority, application Japan, Feb. 8, 1982, 57-17604
Int. Cl.[4] G02B *5/08, 5/12;* A47G *1/24*
U.S. Cl. 350—634 **8 Claims**

5. An electric remote control mirror apparatus comprising a mirror having a backing member,

mirror housing means for receiving said mirror,

means for pivotally mounting said mirror within said mirror housing means to thereby define a pivoting axis, said pivotal mounting means including a housing member secured within said mirror housing means,

a pivot connection comprised to a partial ball base having a concave surface integrally formed with and extending outwardly from said housing member, means defining a cylindrical hole extending inwardly away from the central portion of said concave surface coaxially with the pivot axis to a bottom portion, at least one elongated projection formed so as to extend along the inner wall of said cylindrical hole in the direction of the pivot axis, means defining a column at the central bottom portion of said cylindrical hole means, said column means extending outwardly away from said bottom portion toward said concave surface coaxially with said pivot axis, said column means further including means defining an elongated interior opening, said backing member including a hollow convex shaped partial spherical projection integrally formed therewith and dimensioned to fit within said concave surface and having means defining a centrally positioned opening therein,



a pressure applying member having integrally formed upper and lower portions, said upper portion comprising a convex shaped partial spherical member dimensioned to fit within the interior of said hollow convex shaped portion of said backing member, said lower portion comprising a cylindrical member dimensioned to fit into said cylindrical hole means and through said opening means in said hollow convex shaped projection, said cylindrical portion having an annular end wall for fitting around said column means and means defining at least one slot for engaging said at least one elongated projection for preventing rotation of said mirror around the pivot axis, and

a coil spring disposed within said cylindrical portion about said column, one end thereof being in contact with a seat adjustably mounted at the top of said column and the other end thereof being held against said annular end wall for urging said pressure applying member toward said ball base so that said hollow convex shaped projection is retained between said ball base and said pressure applying member.

4,555,167

MULTIPLE SOUND PICTURE PROJECTION CINEMA

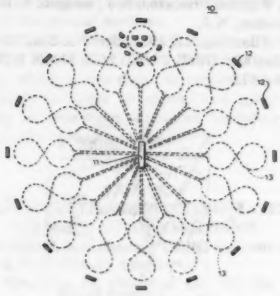
Anthony M. Roland, 19 Albany St., London N.W.1, England

Filed Aug. 1, 1983, Ser. No. 519,127

Int. Cl.⁴ G03B *19/18, 21/32*

U.S. Cl. 352—133 **13 Claims**

1. A multiple screen cinema comprising a projection room having projection windows, a plurality of mutually spaced proximate projection screens spaced from said projection room, a plurality of sound movie projectors located in said projection room and projecting different images toward respective projection screens through said windows, means responsive to each of said sound projectors for producing and limiting to a restricted area within the viewing area of each of said screens an audio modulated magnetic field, each restricted area being accommodative of a plurality of viewers and receiver means carried by each viewer located in a restricted area and responsive susbstantially only to the modulated magnetic field in the respective area for producing corresponding audible signals and being substantially nonresponsive to the magnetic fields in the areas other than that in which the viewer



is located but being responsive to the magnetic field in any of the other areas in which said viewer is located.

4,555,168

DEVICE FOR PROJECTING STEROSCOPIC, ANAMORPHOTICALLY COMPRESSED PAIRS OF IMAGES ON TO A SPHERICALLY CURVED WIDE-SCREEN SURFACE

Walter Meier, Birmensdorf, Switzerland, and Jan Jacobsen, Reutern, Fed. Rep. of Germany, assignors to Walter Meier, Switzerland

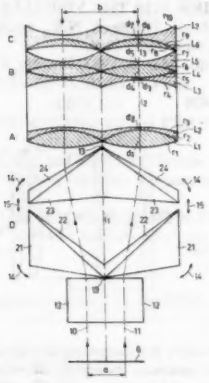
PCT No. PCT/CH82/00099, § 371 Date Apr. 8, 1983, § 102(e) Date Apr. 8, 1983, PCT Pub. No. WO83/00749, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 23, 1982, Ser. No. 488,540

Claims priority, application Switzerland, Aug. 24, 1981, 5452/81; Sep. 23, 1981, 6177/81; Aug. 5, 1982, 4725/82

Int. Cl.⁴ G03B *21/00*

U.S. Cl. 353—7 **18 Claims**



1. An optical device for projecting stereoscopic, linear anamorphotically compressed pairs of images on to a spherically curved wide-screen surface, comprising:

a lighting unit including separate first and second light sources for first and second optical paths of separate first and second image channels, respectively, said light sources having two high pressure arc lamps surrounded by ellipsoidal mirrors, said ellipsoidal mirrors having optical axes at a predetermined angle relative to a plane of symmetry and defining optical illumination axes, and said

lighting unit also including first and second deflecting prisms for displacing the illumination axes in directions parallel to said plane of symmetry;

two projection basic lens systems positioned in said optical paths of said lighting unit;

a film plane in said optical paths between said lighting unit and said basic lens systems; and

two supplementary lens systems, in said optical paths on a side of said basic lens systems remote from said lighting unit, for determining said optical paths of each of said image channels, said supplementary lens systems including decompression means for anamorphotically decompressing stereoscopic image paths and including a focal lens means for distortion-free superwide angle imaging of the image pairs displaced by a base distance on a spherically curved surface.

4,555,169

FOCUS DETECTING DEVICE FOR A CAMERA

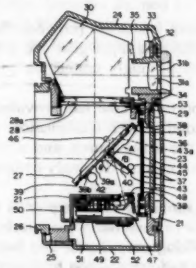
Yasuo Suda; Akira Akashi; Akira Ishizaki; Akira Hiramatsu, all of Yokohama, and Keiji Ohtaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,244

Claims priority, application Japan, Sep. 13, 1983, 169915; Sep. 13, 1983, 169916; Sep. 13, 1983, 169917; Sep. 13, 1983, 169918; Sep. 13, 1983, 169919

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—407 **24 Claims**



1. A focus detecting device for a camera for detecting a focusing state of an imaging lens comprising:

first reflection means for reflecting a light flux from the imaging lens toward a bottom of a camera body;

second reflection means for reflecting a light flux from said first reflection means in a direction substantially parallel to an optical axis of the imaging lens;

third reflection means for reflecting the light flux from said second reflection means in a direction substantially normal to the optical axis of the imaging lens;

optical means for forming an image variable in accordance with a focusing state of the imaging lens based on the light flux transmitted through the imaging lens, said optical means being arranged between said second and third reflection means along the direction of reflection of the light flux by said second reflection means;

sense means for sensing the image formed by said optical means to produce a signal for detecting the focusing state of the imaging lens, said sensing means being arranged along the direction of reflection of the light flux by said third reflection means.

4,555,170

DEVICE FOR ILLUMINATING DISPLAY UNIT IN VIEWFINDER

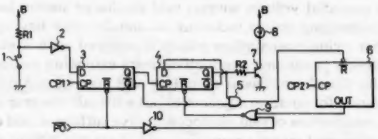
Yoshio Wakui; Kiyoshi Negishi, and Eiichi Tano, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1985, Ser. No. 689,265

Claims priority, application Japan, Jan. 23, 1984, 59-8486

Int. Cl.⁴ G03B *17/18, 17/20*

U.S. Cl. 354—470 **4 Claims**



1. A device for controllably illuminating a display unit in the viewfinder of a camera, comprising:

a light source for illuminating said display unit in said viewfinder;

an operating switch for operating said light source;

a timer which, when said operating switch is turned off, operates for a predetermined period of time; and

lighting circuit means for maintaining said light source turned on while said operating switch is turned on and while said timer is operating, said lighting circuit turning off said light source when said operating switch is turned on during operation of said timer.

4,555,171

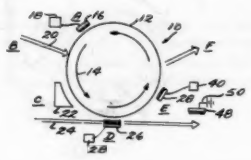
CONDUCTIVE CHARGE/DISCHARGE DEVICE

Richard S. Clouthier, Penfield, and Thomas A. Rogers, Fairport, both of N.Y., assignors to Schlegel Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 358,107, Mar. 15, 1982, abandoned. This application Feb. 16, 1983, Ser. No. 467,168

Int. Cl.⁴ G03G *15/02*

U.S. Cl. 355—3 CH **22 Claims**



1. In a copying apparatus of the type having a photoconductive surface, a charging station to impart an electrostatic charge distribution to at least a portion of said photoconductive surface, an exposure station to impose an image on said portion of said surface, to thereby influence the charge distribution, a development station at which a developing material is deposited on said portion of said surface in a pattern corre-

sponding to the image to be reproduced, a transfer station having means for transferring the pattern to a sheet means and a discharge station for dissipating electrostatic charge on said portion of said surface, said photoconductive surface and said stations being relatively movable whereby a portion of said photoconductive surface is locatable adjacent a selected station, the improvement comprising said charging station including a charging device comprising an elongated, linear distribution of conductive fibers mounted on a conductive support means and extending across said charging station, with from 6 to 84 fibers per lineal inch and means connecting said fibers to a potential voltage source, said discharge station including a discharging means including an annular core having an exterior cylindrical surface which is covered with a plurality of closely positioned conductive fibers extending generally radially therefrom, means mounting said core of said discharging station for rotation adjacent to but with said fibers spaced from a said portion of said photoconductive surface at said discharge station and means connecting said fibers to a potential voltage source with a polarity different from that of said potential voltage source of said charging means.

4,555,172

DEVELOPING APPARATUS

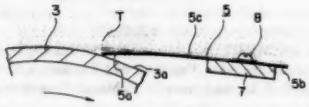
Michio Mogi, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

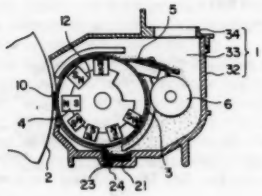
Filed Jul. 8, 1982, Ser. No. 396,285

Claims priority, application Japan, Jul. 10, 1981, 56-107051; Jul. 18, 1981, 56-112814; Jul. 20, 1981, 56-114126

Int. Cl.⁴ G03G *15/09*

U.S. Cl. 355—3 DD **17 Claims**





1. In a developing apparatus equipped with a sleeve placed inside a casing for storing developer and transferring the developer by means of the circumferential surface thereof and a scraper member positioned confronting the circumferential surface of said sleeve to scrape off the developer from the circumferential surface of said sleeve, the improvement wherein said scraper member is movable and is normally urged resiliently in the direction away from said sleeve to a first position which separates it a predetermined distance from the circumferential surface of said sleeve, and when there is developer on said scraper member the weight thereof causes the tip of said scraper member to move to another position closer to the circumferential surface of said sleeve.

16. In developing apparatus wherein a gap of limited width is defined between a developing sleeve and a restriction member for restricting the flow rate of developer, said restriction member being disposed so as to confront said sleeve, and said gap being changeable along the axial direction of said developing sleeve, the improvement wherein said restriction member has an adjusting member, and said gap can be adjusted by means of said adjusting member from the outside of the developing apparatus.

4,555,173

ELECTROSTATIC COPYING APPARATUS

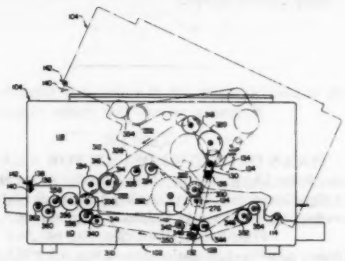
Masahide Iseki, Neyagawa; Toshio Yoshiyama, Sakai; Hiroshi Kajita, Kobe; Masanori Itakiyo, Sakai; Hiroshi Kusumoto, Takaishi; Yoshizo Kawamori, Fujiidera, and Masuo Kawamoto, Daito, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Nov. 15, 1983, Ser. No. 551,794

Claims priority, application Japan, Nov. 30, 1982, 57-209849

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **7 Claims**



1. An electrostatic copying apparatus having a first and a second supporting frames connected to each other for relative pivotal movement between an open position and a closed position, wherein

the first supporting frame has provided therein a rotatably mounted interlocking input gear and a first power transmission system drivingly connected to the interlocking input gear;

the second supporting frame has provided therein a drive source, a second power transmission system drivingly connected to the drive source, and a rotatably mounted interlocking output gear drivingly connected to the drive source;

a pivot member mounted for free pivotal movement about the central axis of rotation of the interlocking input gear or the interlocking output gear and held elastically at a predetermined angular position by a spring means is provided in the first supporting frame or the second supporting frame, and an interlocking linking gear is rotatably mounted on the pivot member;

when the pivot member is provided in the first supporting frame, the interlocking linking gear is in mesh with the interlocking input gear, and the interlocking input gear is drivingly connected to the first power transmission system so that it can freely rotate over a slight angular range with respect to the first power transmission system;

when the pivot member is provided in the second supporting frame, the interlocking linking gear is in mesh with the interlocking output gear, and the interlocking output gear is drivingly connected to the drive source so that it can rotate freely over a slight angular range with respect to the drive source; and

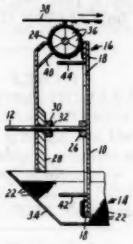
when the first and second supporting frames are relatively pivoted to the closed position, the interlocking linking gear is brought into mesh with the interlocking output gear or the interlocking input gear and as a result, the drive source is drivingly connected to the first power transmission system through the interlocking output gear, the interlocking linking gear and the interlocking input gear.

4,555,174

MAGNETICALLY ATTRACTABLE DEVELOPER MATERIAL TRANSPORT APPARATUS

George J. Kramer, Troy Township, St. Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 19, 1983, Ser. No. 563,123
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 DD 15 Claims



1. Apparatus for transporting magnetically attractable particles presented at a first position to a second position at which a magnetic field is present to attract magnetically attractable particles from the apparatus including:

a support member adapted for rotation about an axis that is located between the first and second positions,

said support member having a planar surface area at which a magnetic field is presented, said planar surface area located at a distance from said axis that is greater than the dimension of said support member at said planar surface measured in the direction defined by said axis, said distance from said axis causing said planar surface area to move between the first and second positions upon rotation of said support member.

4,555,175

MEASURING COMPRESSION OF CABLED OPTICAL FIBERS

William B. Gardner, Atlanta; Parbhubhai D. Patel, Dunwoody; Dan L. Philen, Atlanta, and Manuel R. Santana, Doraville, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 15, 1983, Ser. No. 475,620
Int. Cl.[4] G01B *11/02*
U.S. Cl. 356—32 8 Claims

1. A method of measuring the excess length of optical fiber in an optical fiber cable characterized by applying a stress to said cable along its longitudinal axis while optically monitoring the longitudinal strain applied to at least one fiber in said cable,

increasing the magnitude of said stress at least until said fiber is subjected to a tensile strain,

determining the tensile strain applied to said cable for which said fiber is initially subjected thereby to a tensile strain, and

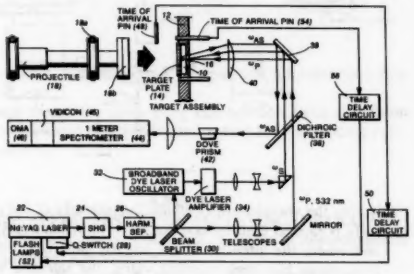
thereby determining said excess length of said fiber.

4,555,176

METHOD AND APPARATUS FOR DETERMINING PRESSURE-INDUCED FREQUENCY-SHIFTS IN SHOCK-COMPRESSED MATERIALS

David S. Moore, and Stephen C. Schmidt, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,150
Int. Cl.[4] G01N *21/65*
U.S. Cl. 356—301 12 Claims



1. An apparatus for conducting coherent anti-Stokes Raman scattering spectroscopy on shock-compressed materials, comprising:

a sample containment vessel having an optically transparent window forming one wall of said vessel, and an opposing, substantially parallel optically reflective wall;

shock means for applying a shock to said optically reflective wall so as to generate a shock wave in a sample contained in said vessel, said shock wave traveling from said reflective wall toward said optically transparent window,

laser means for producing a pump beam and a Stokes beam, and means for directing said pump beam and said Stokes beam through said optically transparent window so as to intersect in said sample between said window and said reflective wall as said shock wave passes through said sample; and

spectrometer means positioned to receive a coherent anti-Stokes beam emitted from the sample toward the reflective wall and reflected therefrom through the window along a path substantially parallel to the pump and Stokes beams.

4,555,177

METHOD AND APPARATUS FOR DETECTING SINGLET STATE RESONANCE FLUORESCENCE

Terence W. Barrett, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

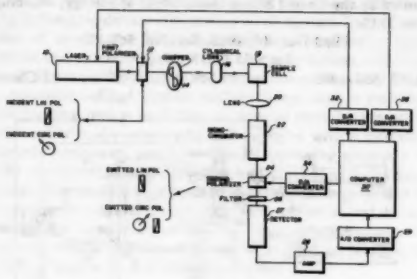
Filed Dec. 22, 1983, Ser. No. 564,583
Int. Cl.[4] G01N *21/64*
U.S. Cl. 356—318 11 Claims

1. A method for detecting the wavelength for singlet state resonance fluorescence of a sample, comprising:

sequentially illuminating the sample with incident light of different wavelengths, wherein at each wavelength the sample is sequentially illuminated with different components of the incident light, the incident components including a linearly polarized component, and an incident circularly polarized component;

detecting light emitted from the sample resulting from excitation by the incident light and subsequent spontaneous molecular energy transitions, wherein, for each wavelength of the incident light, intensities of components of the emitted light are sequentially detected, the compo-

nents of the emitted light including a linearly polarized emitted component, resulting from the incident linearly polarized component, and a circularly polarized emitted component, resulting from the incident circularly polarized component;



selecting the wavelength at which the intensity of the circularly polarized emitted component is approximately zero and where the intensity of the linearly polarized emitted component has some positive value, the selected wavelength being the wavelength for resonance fluorescence.

4,555,178

METHOD FOR THE MEASUREMENT OF THE DIFFERENCE IN THE OPTICAL PROPERTIES DEPENDENT ON THE LIGHT DIRECTION OF TWO SAMPLES

Hannu Harjunmaa, Espoo, Finland, assignor to Labsystems Oy, Helsinki, Finland

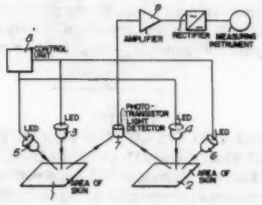
PCT No. PCT/FI83/00050, § 371 Date Feb. 2, 1984, § 102(e) Date Feb. 2, 1984, PCT Pub. No. WO84/00213, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 21, 1983, Ser. No. 579,887

Claims priority, application Finland, Jun. 29, 1982, 822306

Int. Cl.⁴ G01N *21/47*

U.S. Cl. 356—339 **3 Claims**



1. Method for measuring the difference in response of two samples to incident light directed at the samples from different angles and detected by a common light detector, characterized by the steps of irradiating said two samples simultaneously during a first interval with a first pair of light beams, one beam of said first pair being directed at one of said samples at a first angle, the other beam of said first pair being directed at the other of said samples at a second angle different from said first angle, irradiating said two samples simultaneously during a second interval with a second pair of light beams, one beam of said second pair being directed at said second angle at said one of said samples, the other beam of said second pair being directed at said first angle at said other of said samples, said first and second intervals occurring alternately in succession, and detecting at a common point the light from said light beams reaching said common point due to a given optical parameter of said samples.

4,555,179

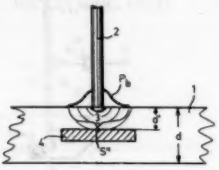
DETECTION AND IMAGING OF OBJECTS IN SCATTERING MEDIA BY LIGHT IRRADIATION

John Langerholc, Paul-Klee-Str. 8, 8000 Munich 71, and Thorsteinn Halldórsson, Lerchenauerstrasse 2, 8 Munich 40, both of Fed. Rep. of Germany

Filed Nov. 8, 1982, Ser. No. 439,867

Int. Cl.⁴ G01N *21/00*

U.S. Cl. 356—342 **15 Claims**



1. A method for detecting and imaging objects surrounded by a scattering medium comprising: illuminating the scattering medium with a collimated light beam incident upon and penetrating said medium; scanning the collimated light beam through a region of the scattering medium and at successive positions along a scanning path across a selected scanning area; detecting the back scattered light in the scattering zone around the locus of incidence of the collimated light beam on the scattering medium and measuring the intensity of the back scattered light from the scattering zone at successive positions along the scanning path across said scanning area; registering the measured intensity of light from the scattering zone at said successive positions along the scanning path; and associating differential measurements registered along the scanning path with the possible presence of an object.

4,555,180

PRINTED AREA MEASURING APPARATUS

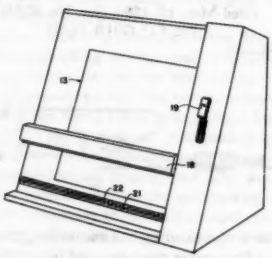
Tatsunosuke Masuda, Kyoto; Tetsuo Hohki, Ibaragi, and Yasuo Kurusu, Otsu, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 18, 1983, Ser. No. 476,628

Claims priority, application Japan, Apr. 3, 1982, 57-55670

Int. Cl.⁴ G01N *21/55*

U.S. Cl. 356—445 **2 Claims**



1. An improved apparatus for measuring the printing area of a printing plate upon which a printing image area is formed of the type having a scanning head, movable in relation to the printing image area, which includes light sources arranged linearly and a plurality of photoelectric transfer elements arranged in parallel with the linear arrangement of light sources, wherein the quantity of light from said light sources reflected

from said printing plate is measured by said photoelectric transfer elements during a scanning operation of said scanning head, and the data obtained by such measurement is processed to measure said printing area, the improvement comprising:

proving sensor means, separate from and movable independently of said scanning head, for measuring separately from said scanning operation a portion of said printing plate having a 0% signal level and a portion of said plate having a 100% signal level to provide calibration data for correcting the measurement of the printing area by said scanning head, said proving sensor means having at least one light source and one photoelectric transfer element.

4,555,181

APPARATUS FOR AUTOMATICALLY DETECTING AND EVALUATING THE CHARACTERISTICS OF PRINTS

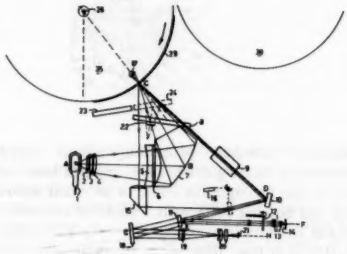
Jan W. Klumper, Alphen a/d Rijn, and Huibert Visser, Zevenhuizen, both of Netherlands, assignors to de Nederlandsche Bank N.V., Amsterdam, Netherlands

Filed Oct. 23, 1981, Ser. No. 314,292

Claims priority, application Netherlands, Nov. 7, 1980, 8006097

Int. Cl.⁴ G07D *7/00*

U.S. Cl. 356—448 **7 Claims**



1. Apparatus for automatically detecting and evaluating one or more characteristics of prints by comparing optically obtained data of a print to be tested with a standard print, comprising a light source in a first focussing optical system, a reflector means located in a region behind and spaced apart from the print to be tested and forming a background for a test field of the print to be tested and a light sensitive detection means in a second focussing optical system, said first focussing optical system and said second focussing optical system being directed to said test field and having their optical axes set at equal. but opposite angles with respect to a normal to the test field said reflection. means being for reflecting light from said first optical system passing through said print, into said second optical system, an area of said test field illuminated by said first focussing optical system being located in a focal plane of said reflection means.

4,555,182

APPARATUS AND METHOD FOR RECYCLING ASPHALTIC CONCRETE

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Division of Ser. No. 293,283, Aug. 17, 1981, Pat. No. 4,481,039. This application Jul. 26, 1984, Ser. No. 634,591

Int. Cl.⁴ B28C *5/46*

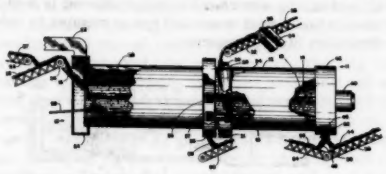
U.S. Cl. 366—25 **16 Claims**

1. An apparatus for treating asphaltic concrete comprising

an elongated rotatable drum having a burner at a first end thereof for directing flame and hot gases of combustion into said drum toward an opposite second end,

first means for introducing composition into said drum intermediate said first and second ends in a first section of said drum,

second means for introducing composition into said drum adjacent said second end in a second section of said drum,



first means for recovering composition adjacent said first end, and

second means for recovering composition from said drum between said first and second means for introducing composition.

4,555,183

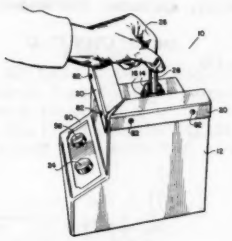
HIGH SPEED TEST TUBE AGITATOR APPARATUS

Rees D. Thomas, Lambertville, N.J., assignor to Reese Scientific Corporation, Lambertville, N.J.

Filed Feb. 6, 1984, Ser. No. 577,488

Int. Cl.⁴ B01F *11/00*

U.S. Cl. 366—208 **17 Claims**



1. A high speed laboratory mixer apparatus comprising:

a motor;

eccentric means attached to said motor for describing a circular path;

bearing means attached to said eccentric means;

cup means attached to said bearing means for supporting the base of a labortory test tube; and,

non-resilient restraining means attached to said cup means for allowing said cup to translate in a circular path while preventing said cup means from rotating.

4,555,184

MODULE FOR COMBINATION TIMEPIECE

Motoyuki Fujimori, Shiojiri, Japan, assignor to Shiojiri Kogyo Kabushiki Kaisha, Suwa, Japan

Filed Dec. 1, 1983, Ser. No. 557,036

Claims priority, application Japan, Dec. 7, 1982, 57-215287

Int. Cl.⁴ G04B *19/04*

U.S. Cl. 368—88 **11 Claims**

1. A combination time piece of modular construction comprising:

a power source;

a frequency source coupled to the power source;

circuit means for performing timekeeping functions, having an aperture therein, coupled to the power source and frequency source;

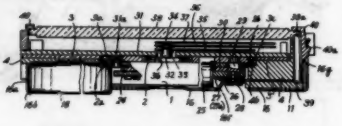
an analog dial;

a spacer member disposed between the dial and the circuit

means, said spacer member having a second aperture aligned with the aperture of said circuit means;

stiff reinforcement member disposed between the dial and spacer means

an analog movement coupled to the circuit means, a portion of said analog movement being positioned in said apertures in said circuit means and spacer member to reduce a dimension of the timepiece;



analog hand display means coupled to the analog movement on top of the circuit means, said analog hand display means having a rotational center; and

electronic liquid crystal display means coupled to the circuit means and overlying the analog hand display means, said electronic liquid display means covering the rotational center of the analog hand display means.

4,555,185

TIME SETTING MECHANISM FOR A TIMEPIECE HAVING AN ANALOG MECHANICAL DISPLAY

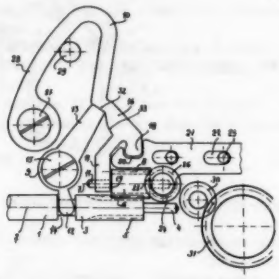
Cyril Vuilleumier, Bienne, Switzerland, assignor to Omega SA, Bienne, Switzerland

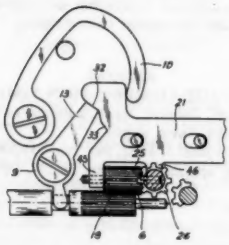
Filed Nov. 8, 1983, Ser. No. 549,859

Claims priority, application Switzerland, Nov. 9, 1982, 6502/82

Int. Cl.⁴ G04B *27/02*

U.S. Cl. 368—190 **9 Claims**





1. A time setting mechanism for a timepiece having an analog mechanical display with at least an hours hand and a minutes hand comprising a manually operable crowned stem capable of being toggled into at least two axial positions, an axially displaceable pinion and means slaving said pinion to the stem whereby the pinion may assume at least two distinct positions as determined by the axial positions of the stem, said stem including a toothed pinion, the axially displaceable pinion being rotatively mounted about an axis parallel to the stem axis, said axes being non-coincidently arranged in a manner such that the respective pinions mesh with one another and the slaving means being arranged and adapted such that with the stem in a drawn-out axial position the axially displaceable pinion drives the time setting gears when the stem is rotated.

4,555,186

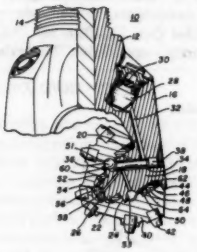
AMORPHOUS ALLOY PLAIN BEARINGS

David M. Scruggs, San Juan Capistrano, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 10, 1984, Ser. No. 578,895

Int. Cl.⁴ E21B *9/08*

U.S. Cl. 384—93 **15 Claims**



1. A boundary lubricated plain bearing pair comprising relatively moveable bearing surfaces in opposed load bearing sliding engagement through a thin film of lubricant wherein at least one of said bearing surfaces is formed of an amorphous alloy having as an essential component a refractory metal and having a VHN of at least 1000 and a crystallization temperature above 600° C.

4,555,187

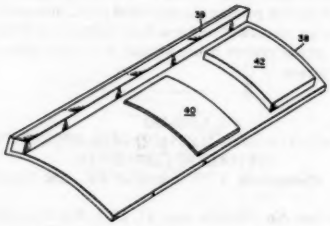
FOIL BEARING ALIGNMENT

Reinhard M. Klaass, Phoenix, and Francis J. Suriano, Scottsdale, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 430,429, Sep. 30, 1982, Pat. No. 4,502,795. This application Jun. 11, 1984, Ser. No. 619,090

Int. Cl.⁴ F16L *32/06*

U.S. Cl. 384—103 **7 Claims**



1. A compliant foil for a diverging fluid bearing, said foil comprising a compliant member having at least two shims disposed along its axial length, each of said shims having a uniform thickness along its axial length with one shim having a greater uniform thickness than the other shim.

4,555,188

BEARING AND SEAL ASSEMBLY

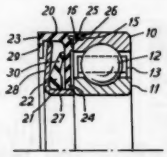
Hubert W. T. Neal, Luton, England, assignor to SKF (U.K.) Limited, Luton, England

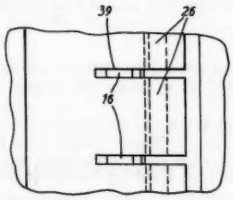
Filed Dec. 11, 1984, Ser. No. 680,572

Claims priority, application United Kingdom, Dec. 21, 1983, 8333962

Int. Cl.⁴ F16C *33/78*

U.S. Cl. 384—482 **17 Claims**





1. A ball or roller bearing and seal assembly in which the bearing comprises an outer bearing ring, an inner bearing ring, and rolling elements disposed between the two bearing rings and in rolling engagement therewith, the periphery of one of the bearing rings being formed with a recess having a side wall thereof facing in the direction away from the seal, and the seal comprises a component having one or more claws engaged in said recess, wherein the assembly comprises resilient means which urge the seal component in a direction away from said one bearing ring so as to engage the claw or claws as a tight fit against said side wall of the recess.

4,555,189

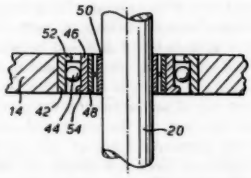
WINCHESTER DISC DRIVE

Charles W. Donkin, Falkland, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 23, 1982, Ser. No. 444,126

Int. Cl.⁴ F16C *33/04, 23/08, 27/08*

U.S. Cl. 384—493 **3 Claims**



1. In apparatus including a head-positioning actuator in a disc data store, a shaft for supporting the head-positioning actuator, a yoke for supporting the shaft, and a first rotary bearing mounted in said yoke and surrounding said shaft at a first location to allow said shaft rotate about an axis, the improvement comprising:

a removable composite bearing assembly mounting in said yoke at a second location to allow rotation of said shaft about said axis and allowing axial movement of said shaft along said axis, said composite bearing assembly being self-contained to include a second rotary bearing and an axial bearing, said second rotary bearing surrounding said shaft to allow rotation about said axis at said second location, said axial bearing mounted in said yoke and surrounding said second rotary bearing, said axial bearing having an outer axial ring and an inner axial ring with bearings in between, both said outer axial ring and said inner axial ring having stops to contain said bearings, said stops being separated by free space to allow free movement of said bearings along said axis between said stops, said outer ring mounted on said yoke and said inner ring surrounding said second rotary bearing, said axial movement of said bearings allowing said inner axial ring, said second rotary bearing, and said shaft to move along said axis;

wherein said outer axial ring comprises a plurality of axially-extensive outer recesses on the face thereof intermediate between said inner and said outer rings, wherein said inner axial ring comprises a corresponding plurality of axially-extensive inner recesses on the face thereof intermediate between said inner and said outer rings and wherein said plurality of balls are held between pairs of said outer recesses and said inner recesses whereby said outer and said inner axial rings are permitted mutual axial movement but are denied mutual rotational movement; and

wherein said first outer axial stop is an end wall in at least one of said plurality of outer recesses and wherein said first inner axial stop is an end wall in at least one of said plurality of inner recesses.

4,555,190

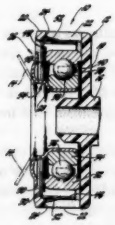
CLUTCH RELEASE BEARING ASSEMBLY

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1985, Ser. No. 692,124

Int. Cl.⁴ F16D *23/14*; F16C *19/00, 33/30*

U.S. Cl. 384—495 **3 Claims**



1. An improved self-centering bearing assembly for a clutch release mechanism or the like of the type in which a carrier axially movable toward and away from a set of declutching elements has a radial bearing mounted thereto by an attachment member detachably joinable to said carrier with a resilient element axially compressed between a radial flange of said attachment member and a face of a race of said bearing that is non-rotatable relative to said carrier, with a rotatable race of said bearing having a contact member engageable with said declutching elements as said carrier moves axially theretoward, said improvement comprising:

a retention and shielding portion extending from said contact member radially past said attachment member radial flange and axially spaced from said face of said non-rotatable race by a distance sufficiently small that, when said attachment member is detached from said carrier, said resilient element may cooperate with said retention and shielding portion by axially expanding to bias said attachment member radial flange into said retention and

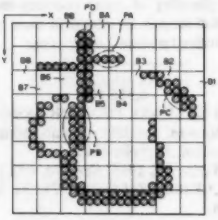
shielding portion to retain said attachment member to said bearing as a substantially rattle-free unit and so that, when said attachment member is joined to said carrier to compress said resilient element, said attachment member radial flange will move axially away from said retention and shielding portion just sufficiently to allow the bearing races to relatively rotate, whereby said attachment member radial flange and said retention and shielding portion may cooperate to shield said bearing.

4,555,191

METHOD OF REDUCING CHARACTER FONT

Tomomi Gojo, Zama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,319
Claims priority, application Japan, Nov. 5, 1983, 58-206914
Int. Cl.[4] B41J *3/02*; H04N *1/00*
U.S. Cl. 400—121 **5 Claims**



1. A method of reducing a character font in which font data representative of the character font consists of a dot matrix having a plurality of rows of arranged in a first direction and a plurality of columns of arranged in a second direction perpendicular to the first direction, said method comprising the steps of:

(a) producing first data by dividing one of the rows in the first direction into a plurality of blocks such that each of the blocks includes a predetermined number of dots and, then, converting the one row to unit dots associated with the respective blocks;

(b) producing second data by shifting the row in the step (a) in the first direction to constitute a shifted row, then dividing the shifted row into a plurality of blocks, and then converting the shifted row to unit dots associated with the respective blocks;

(c) computing third data by associating the first and second data with each other in the second direction;

(d) computing third, row-by-row data by sequentially performing the steps (a), (b) and (c) in the second direction on the rows of a number which corresponds to the predetermined number;

(e) computing fourth data by associating in the second direction the third, row-by-row data computed by the step (d);

(f) computing the fourth data associated with the whole character font by repeating the consecutive steps (a) through (e); and

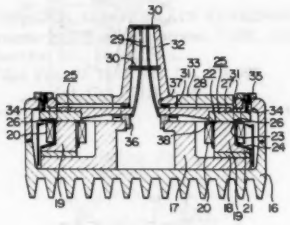
(g) converting the respective blocks consisting of dots associated with the plurality of fourth data computed by the step (f) to unit dots associated with the respective blocks.

4,555,192

RELEASE TYPE DOT PRINTER HEAD

Kuniaki Ochiai, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 582,715
Claims priority, application Japan, Feb. 25, 1983, 58-31395; Feb. 28, 1983, 58-33613
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **14 Claims**



1. A release type dot printer head comprising:

(a) a casing;

(b) an annular yoke secured to said casing;

(c) a permanent magnet secured to an upper face of said annular yoke;

(d) a plurality of cores, each of said plurality of said cores being secured to an upper face of said permanent magnet and each of said plurality of cores having an attractive face at the top thereof and a fulcrum at the top outer edge thereof;

(e) a plurality of coils, each of said plurality of coils being wound around an associated one of said plurality of cores;

(f) a plurality of armatures, each of said plurality of armatures being disposed for pivotal movement about the fulcrum on the associated one of said plurality of cores;

(g) a plurality of needles, each of said plurality of needles being secured to the inward end of an associated one of said plurality of armatures;

(h) a plurality of magnetic members, one of said plurality of magnetic members being disposed on the opposite side of an associated one of said plurality of armatures from the associated one of said plurality of cores, each of said plurality of magnetic members serving as a part of a side magnetic path which also includes said yoke and the associated one of said plurality of armatures; and

(i) a plurality of non-linear springs, each of said plurality of non-linear springs being disposed between an associated one of said plurality of armatures and an associated one of said plurality of magnetic members to resiliently bias the associated one of said armatures for pivotable movement about its fulcrum on the associated one of said cores against the attractive force of said permanent magnet, which attractive force acts on the associated one of said armatures through its attractive face, said plurality of non-linear springs not being in said side magnetic paths and each of said plurality of non-linear springs being selected so that the torque which it imparts to the associated one of said plurality of armatures as a function of the displacement of the associated one of said plurality of needles approximately the opposite torque imparted to the associated one of said plurality of needles by said permanent magnet.

4,555,193

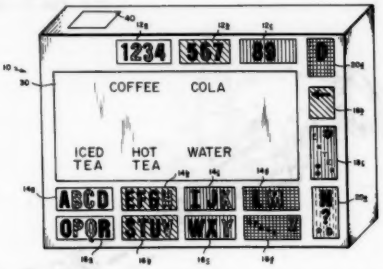
KEYBOARDS INCLUDING COLOR CODING AND ONE HANDED OPERATION

Philip J. Stone, 70 Francis Ave., Cambridge, Mass. 02138

Filed Oct. 31, 1983, Ser. No. 546,884

Int. Cl.[4] B41J *5/10*

U.S. Cl. 400—486 **23 Claims**



1. A keyboard for selecting characters from a variety of characters including all the letters of an alphabet, said keyboard comprising:

a plurality of fields of keys, each field including a plurality of single-field keys which identify a particular character when actuated concurrently with one other of said single-field keys from within the same field, said plurality of fields of keys being arranged for operation by one hand wherein each key has a background color and each character is printed on a key in a particular color so that actuation of a key upon which a character is printed concurrently with actuation of a key in the same field whose background color is identical to the color of said character causes the selection of said character.

4,555,194

APPLICATOR WITH RESILIENT VALVE

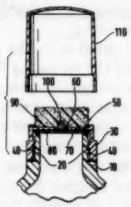
Geoffrey R. Hammond, Hull, England, assignor to Reckitt & Colman Products Limited, London, England

Filed May 16, 1984, Ser. No. 610,744

Claims priority, application United Kingdom, May 26, 1983, 8314585

Int. Cl.[4] B05C *17/00*

U.S. Cl. 401—206 **9 Claims**



1. An applicator for applying liquids to surfaces when attached over the open mouth of a container, the applicator comprising a substantially rigid body (**30**) engageable with the container mouth, an applicator pad (**90**) bonded to the body (**30**), a resilient, substantially plane diaphragm (**70**) associated with the body (**30**) and provided with a split (**80**) offset from the center of the diaphragm for the passage of liquid from the container, and an actuator member (**100**) having one end in contact with the diaphragm (**70**) and the other end extending into the applicator pad (**90**) such that when the applicator pad (**90**) is pressed against a surface to be treated the actuator member (**100**) is displaced causing the diaphragm (**70**) to distort, opening the slit (**80**) and allowing liquid to flow from the container to the applicator pad (**90**), characterized in that the body (**30**) has a transverse wall (**50**) having therethrough a dispensing aperture for liquid in the container, the applicator pad (**90**) is bonded to the body (**30**) over the end of said aperture that is remote from the container, the substantially plane diaphragm (**70**) is located on the side of the transverse wall (**50**) adjacent the container and engages the container mouth in sealing contact therewith and is adapted to cover the dispensing aperture (**60**), and the slit (**80**) in the diaphragm (**70**) is situated intermediate its zone of contact with the container mouth and that portion of the diaphragm adapted to cover the dispensing aperture (**60**).

4,555,195

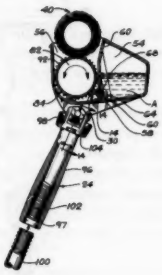
PAINTING TOOL

Joop J. deVreeze, Veendam; Zwier Tijssen, Sportlaan, both of Netherlands, and Daniel Doorley, Salem, Mass., assignors to Multigood, b.v., Netherlands

Filed Jul. 15, 1983, Ser. No. 514,227

Int. Cl.[4] B43M *11/02;* **B05C** *17/02*

U.S. Cl. 401—218 **1 Claim**



1. A painting tool, comprising:

a housing including a handle;

a first paint reservoir;

a secondary paint reservoir;

a roller containing cavity within said housing having an internal wall defining a pair of sealing ledges which flank the secondary reservoir at either end of said housing;

a first paint roller rotatably mounted within said housing;

a second, paint transfer roller rotatably mounted within said cavity rotating engagement with said first paint roller and in fluid communication with said first paint reservoir such that is transferred from the surface of the second, paint transfer roller to the surface of the first paint roller, said second, paint transfer roller having a pair of end portions and an intermediate portion between said end portions, said end portions having a larger diameter than said intermediate portion and arranged to rotate in sealing abutment with the sealing ledges of said housing, said intermediate portion including a plurality of projections spaced about said second paint transfer roller defining a paint transfer means, said secondary paint reservoir being defined generally intermediately of said second, paint transfer roller, adjacent said intermediate portion, to transfer paint thereto; and

a removable, rotary valve between said first and secondary paint reservoirs including an integrally formed generally arcuate valve casing defining on its forward end a slot segment projecting into said secondary paint reservoir and on its rearward side a stop means at the end of said first reservoir, said valve further including a valve stem adapted to be removably snap fit in said valve casing, said stem defining a generally cylindrical portion journalled in

said casing and a wiper portion extending diametrically away from said cylindrical journalled portion, said wiper defining a movable closure for regulating paint flow from the first reservoir to the secondary reservoir in response to rotation of said journalled portion of the valve, said rotation occurring in an arc defined by translation of said wiper from a first limiting contact thereof with said forward slot segment and a second limiting contact with said stop means.

4,555,196

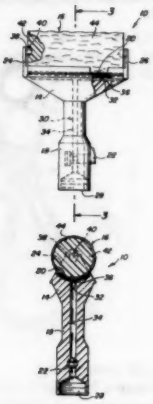
TANNING WAND

Billy B. De Garmo, 121 Jackson St., Weston, W. Va. 26452

Filed May 2, 1983, Ser. No. 490,403

Int. Cl.[4] B43M *11/02*; B44D *3/28*

U.S. Cl. 401—220 **6 Claims**



1. A tanning wand for dispensing tanning oil and the like from a container which comprises:

(a) a housing having a pair of opposite extending end walls;

(b) a resilient roller rotatively mounted to the housing between the end walls;

(c) means for directing the tanning oil through the housing onto the roller along an entire portion of a contact surface thereof, whereby tanning oil may be evenly spread on a surface by frictional engagement with said roller, wherein the wand is an attachment to the container and the housing includes means for securing the housing to the container, wherein said means for securing the housing to the container is a tube, affixed at its upper end to said housing, having a threaded opening at its lower end which mates with a threaded neck of said container;

(d) a T-shaped passage means for directing the tanning oil through the housing onto the roller having a horizontal portion having a plurality of exit apertures therethrough at top of the housing between the end walls and a vertical portion which connects with the threaded opening in the tube; and

(e) a plurality of soft bristle brushes mounted along the top of the housing in alignment with the exit apertures of the horizontal portion of the T-shaped passage so that the soft bristle brushes will aid in the even distribution of the tanning oil on the roller while still allowing rotation of the roller in either direction.

4,555,197

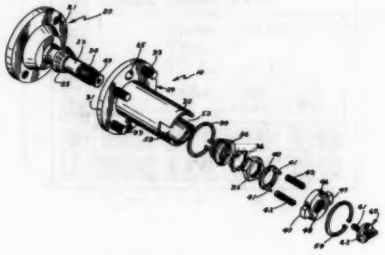
SELECTIVELY FREE WHEELING OR DRIVE HUB FOR VEHICLES

Mervin L. Erickson, 930 Dakota Ave. South, Huron, S. Dak. 57350

Filed Sep. 15, 1983, Ser. No. 532,287

Int. Cl.[4] F16D *1/06*; B60B *27/00*

U.S. Cl. 403—1 **5 Claims**



1. A free wheeling hub adapter for connection between the drive axle of a vehicle and a wheel comprising:

a stub axle having a mounting flange, said mounting flange having means for mounting it onto existing wheel bolts of a vehicle axle on which the adapter is to be mounted;

a hub including a sleeve rotatably mounted on said stub axle, and a wheel flange having means for mounting a wheel identical to the means for mounting on the mounting flange;

selectively engagable and disengagable means for effecting a driving connection between said sleeve and said stub axle comprising a drive member having a central opening and being axially slidably mounted relative to both said stub axle and said sleeve, the interiors of the drive member being axially slidably and rotationally drivably engageable with said stub axle, said sleeve having drive surface means defined thereon, said drive member having radially outwardly extending drive means on the outer periphery thereof rotationally drivably engageable with the drive surface means, and slidable axially along said drive surface means, the drive member in at least one axial driving position being rotationally drivably engaged with both the stub axle and the sleeve;

a washer mounted relative to the hub and retained from movement toward the mounting flange beyond a stopped position, said washer having spring mounting pegs extending from a side thereof facing toward the open end of the hub, said washer being mounted between the drive member and the mounting flange;

spring means having first ends mounted on said pegs and engaging the drive member for urging said drive member in an axial direction outwardly from the mounting flange, said spring means having second ends engaging the drive member and urging said drive member to a disengaged position wherein one of the rotationally drivable connections between the drive member and the stub axle and the drive member and the sleeve respectively, is disengaged; and

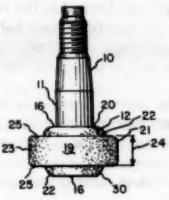
means to control the position of said drive member to overcome the force of said spring means to move the drive member from the disengaged position to position to effect a driving connection from the stub axle to the drive member and thus to the hub sleeve when the drive member is moved axially to its driving position.

4,555,198

RUBBERIZED BALL ROD STUD FOR AUTOMOTIVE STEERING ASSEMBLY

Thomas J. Wenning, New Bremen, and Charles E. Lynn, St. Marys, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 4, 1984, Ser. No. 646,997
Int. Cl.[4] F16C *11/00*
U.S. Cl. 403—130 7 Claims



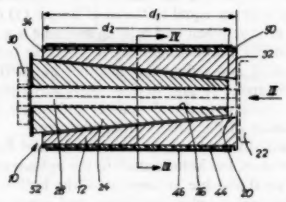
1. A rubberized stud member for a vehicle steering assembly including a metallic ball rod having a ball on one end thereof, said ball having a covering of rubber of 60 to 70 durometer hardness with a thickest section and thinnest sections, said thinnest sections of rubber being at least about 0.079 to 0.159 centimeters thick and the thickest section of rubber being a band at least about 0.44 to 0.70 centimeters thick, said band having a width to thickness ratio of about 2.0 to 3.0.

4,555,199

SUPPORT FOR ENDLESS GRINDING SLEEVES

Peter Maier, Gerokstrasse 1, 7311 Neidlingen; Roland Schirrmacher, Forellenstrasse 74, D-8084 Bachern am Wörthsee, and Rolf Simen, Birnblutenweg 15, D-7000 Stuttgart 80, all of Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,058
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1982, 3243598
Int. Cl.[4] F16D *1/06*
U.S. Cl. 403—370 11 Claims



1. A support for an endless grinding sleeve, comprising:

a casing having a cylindrical outer surface and an axially extending conical inner hole therethrough, said casing having a pair of spaced apart flanges protruding outwardly of said cylindrical surface, said casing having a plurality of blind slots extending therein, each slot having a first end opening at one axial end of said casing and a second end terminating within said casing, a first end of one slot being adjacent a second end of a next slot around said casing;

an elastic lining of rubber-like material engaged on said cylindrical surface of said casing between said flanges and adapted to support an endless grinding sleeve thereon;

a wedging cone having an outer conical surface substantially mating with said conical inner hole of said casing;

a shaft connected to said wedging cone for carrying said casing and elastic lining; and

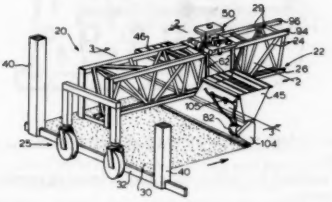
screw thread means engaged with said wedging cone and said casing for urging said wedging cone into said conical inner hole of said casing for radially expanding said casing.

4,555,200

HYDRAULICALLY-POWERED MATERIAL SPREADER

Donald R. Morrison, 6288 Eagle Peak Dr., Charlotte, N.C. 28214

Filed Mar. 26, 1984, Ser. No. 593,108
Int. Cl.[4] E01C *19/20;* F28D *21/00*
U.S. Cl. 404—72 3 Claims



3. The method of cooling hot hydraulic fluid in a hydraulic fluid driven material spreader having a hopper with a heat conductive metal formed hopper wall comprising during operation of the spreader:

(a) flowing said hot fluid through a reservoir having a sidewall mounted on said heat conductive wall of said hopper and allowing the fluid heat to dissipate through said reservoir sidewall and said heat conductive wall of said hopper;

(b) flowing the material to be spread through said hopper in contact with said heat conductive wall on which said reservoir is mounted to allow said material to absorb said heat; and

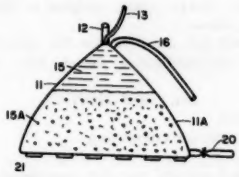
(c) assisting said flow and dissipation of said heat by use of a driven paddle member mounted adjacent the bottom of a material dispenser box in association with the bottom of said hopper.

4,555,201

SEDIMENT DIKE APPARATUS AND METHODS

John A. Paoluccio, 3530 Kiernan St., Modesto, Calif. 95356

Filed Nov. 14, 1983, Ser. No. 551,361
Int. Cl.[4] E02B *3/06, 7/06;* E02D *25/00*
U.S. Cl. 405—117 8 Claims



1. The method of constraining a liquid such as water, either alone or mixed with sand, soil or the like, which includes:

providing an envelope which includes means for draining a liquid therefrom, and said means including providing an envelope having a first face having at least portions of which are fluid pervious and a second face which is impervious to a fluid; and

pumping a mixture of water and soil into said envelope.

4,555,202

TOOL HOLDER WITH TOOL

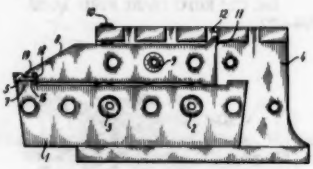
Alfonsius A. T. Pondes, Doetinchem, Netherlands, assignor to Comato B.V., Doetinchem, Netherlands

Filed Nov. 18, 1983, Ser. No. 553,098

Claims priority, application Netherlands, Nov. 18, 1982, 8204473

Int. Cl.⁴ B26D *1/00*

U.S. Cl. 407—117 **7 Claims**



7. A tool holder with a cutting tool comprising

a carrier;

a lower support for said cutting tool releasably connected to said carrier;

an upper clamping member releasably connected to said carrier located above said lower support and parallel to said lower support;

a cutting tool that is clamped between said lower support and said clamping member, said tool having a rear attachment portion which in each cross section perpendicular to said tool's longitudinal axis has been provided with a downwardly converging lower face and an upwardly converging upper face, said lower and upper faces cooperating with a downwardly converging groove of the lower support and an upwardly converging groove of the clamping member respectively;

said lower and upper faces of the attachment portion of said tool as well as the cooperating faces of the grooves of said supporting member and said clamping member extending at an angle to each other which opens in a direction away from the cutting edge of said tool with the lower face and cooperating groove extending substantially parallel to the plane through the cutting edge of the tool and the center of a cylindrical working piece, said plane defining the chip angle with respect to the top surface of said tool at the cutting edge;

said tool further having a rear abutting face in a plane perpendicular to said tool's longitudinal axis and cooperating with an abutment of said clamping member.

4,555,203

DRILLING MACHINE

Shiro Takahashi, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,714

Claims priority, application Japan, Nov. 20, 1981, 56-172011[U]

Int. Cl.⁴ B23B *51/04*

U.S. Cl. 408—119 **5 Claims**

1. A drilling machine comprising:

a spindle;

a hollow shaft axially movable associated by elevating movement of the spindle;

an annular cutter attached to an end of the shaft;

a drill holder disposed within said hollow shaft for axially slidable movement;

a center drill mounted fixedly within said drill holder and on the axis of the annular cutter, said center drill and drill holder being axially slidable independently of the annular cutter and the hollow shaft;

a spring for axially biasing the center drill so that, while the drilling machine is not in operation, the end of the center drill extends beyond the edge of the annular cutter axially of the cutter;

a cylindrical member mounted within a drilling machine holder for slidable movement in the axial direction of said hollow shaft, and in which said hollow shaft is relatively slidable with respect to said cylindrical member;

at least one through-hole formed in the wall of said cylindrical member;

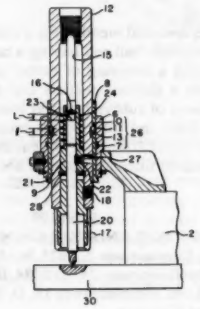
at least one ball received in said through-hole;

a first annular groove formed in the outer periphery of said hollow shaft for receiving said ball therein said groove having an axial length (**1**) permitting axial relative movement between said hollow shaft and the cylindrical member;

a second annular groove formed in the inner periphery of said drilling machine holder for receiving said ball therein;

an engaging groove formed in the upper end of said drill holder;

axially elongated slots formed through the wall of the hollow shaft; and



a pin extending transversely through said cylindrical member and through said axially elongated slots of the hollow shaft and fitted in said engaging groove, a distance (L) between said pin and the bottom of said associated engaging groove being equal to the axial length (**1**) of said first annular groove when said drilling machine is not in operation, said pin preventing relative rotation between said hollow shaft and cylindrical member but permitting the axial movement of said hollow shaft and annular cutter relative to said cylindrical member and center drill due to the existence of the axially elongated slots;

whereby initially said ball is received in said first annular groove to lock the hollow shaft to the cylindrical member for said axial slidable movement of the hollow shaft and the cylindrical member in unison, and when disengaged from said first annular groove and engaged in said second annular groove as a result of said axial movement of the cylindrical member in unison with the hollow shaft, said ball prevents the axial movement of said cylindrical member while permitting the axial slidable movement of said hollow shaft and anular cutter relative to said drilling machine holder and center drill.

4,555,204

METAL-WORKING TOOLS WITH AUGMENTED CONDUCTIVITY

Michael L. Cassidenti, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 542,281, Oct. 14, 1983, abandoned. This application Apr. 30, 1985, Ser. No. 729,078

Int. Cl.⁴ B23C *51/02, 51/06*

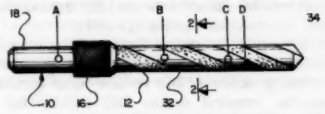
U.S. Cl. 408—144 **12 Claims**

1. In an electrically conductive metal-working tool, through which electric current may be passed for heating a workpiece,

said tool having at least one groove and at least one land, said land being adjacent to a cutting edge, the improvement comprising:

a relatively thick electrically conductive coating bonded to the surface of said groove, said conductive coating being formed from a material having higher electrical conductivity than the material from which the metal-working tool is formed, the land being coating-free, said conductive coating permitting a substantial portion of the electric current to pass therethrough when the tool is shearing a chip from said workpiece,

whereby, during operation of said tool, heating of said cutting edge is minimized.



4,555,205

REAMER HOLDING DEVICE FOR MACHINING VALVE SEATS

Minoru Hiroyasu, Saitama; Hideo Yamashita, Tokyo; Tamotsu Ohguro, Saitama; Shigeru Yamagishi, Tokyo, and Shigenari Shino, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

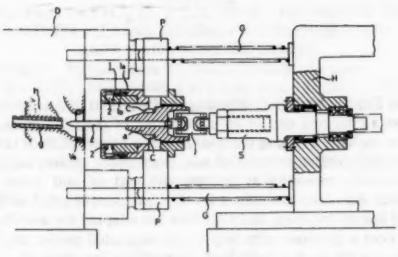
PCT No. PCT/JP82/00107, § 371 Date Nov. 24, 1982, § 102(e) Date Nov. 24, 1982, PCT Pub. No. WO82/03350, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 7, 1982, Ser. No. 451,154

Claims priority, application Japan, Apr. 7, 1981, 56-51162

Int. Cl.⁴ B23B *47/60*

U.S. Cl. 408—150 **8 Claims**



1. A holding device for a rotating tool, comprising:

a tubular member adapted to surround said rotating tool;

at least three support members for supporting said tool, said support members being carried on said tubular member and disposed along a circumferential portion of said tubular member;

a hydraulic system adapted to move said support members substantially radially relative to said tubular member and to lock said support members on said tubular member;

means for driving said tool to rotate while permitting the inclination of said tool so as to render the axis of rotation of said tool to be guided by a bore in a workpiece; and

said hydraulic system being adapted to move said support members radially inwardly into a position at which said support members abut against said rotating tool which has the axis thereof preset at a predetermined posture, and to lock said support members on said tubular member at said position.

4,555,206

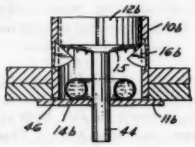
ADHESIVELY SECURABLE FASTENER

Theodore J. Sweeney, Grosse Pointe, Mich., assignor to Theodore Sweeney & Co., Detroit, Mich.

Division of Ser. No. 234,777, Feb. 11, 1981, Pat. No. 4,425,065, which is a division of Ser. No. 936,331, Aug. 24, 1978, abandoned. This application Mar. 4, 1983, Ser. No. 472,084

Int. Cl.⁴ F16B *13/04*

U.S. Cl. 411—23 **8 Claims**



1. An adhesively securable fastener comprising:

a. an elongated body having an opening and having deflectable tabs at a position juxtaposed to the opening;

b. an adhesive positioned within said body; and

c. registering with the opening of the body, a plunger means for applying pressure to said adhesive, thereby adhesively securing the fastener to a substrate by movement of at least a portion of the adhesive from the body to the substrate wherein the plunger further contains an extended frangible portion which permits the pulling of the plunger toward the adhesive.

4,555,207

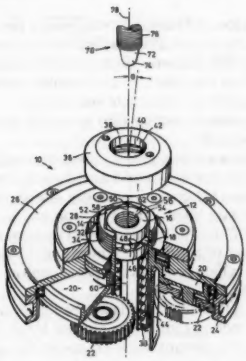
FLOATING NUT

Robert C. Ferguson, Bolton, Canada, assignor to Spar Aerospace Limited, Mississauga, Canada

Filed Apr. 16, 1984, Ser. No. 600,380

Int. Cl.⁴ F16B *37/00*

U.S. Cl. 411—366 **15 Claims**



1. A mating component for a mating assembly which, during assembly, provides at least one degree of freedom of movement selected from radial, axial and angular movement comprising;

(a) an outer member having a chamber extending inwardly from one end thereof, said chamber having side walls which are arranged such that the chamber has a polygon-shaped cross-sectional configuration,

(b) an inner member located within said chamber of said outer member and having external side faces which are arranged to provide a polygon-shaped cross-sectional configuration corresponding to that of said chamber, said inner member

being substantially smaller than said chamber and said outer member so as to provide a clearance gap between said side walls and external side faces,

(c) torque transmitting means mounted in said clearance gap to provide a torque transmitting interference between said external side faces and said side walls while permitting limited relative movement therebetween to provide at least one degree of freedom of movement of said members with respect to one another,

(d) one of said members being adapted to form a mating element which is self-aligning when being engaged with a complimentary mating element of said mating assembly.

4,555,208

METHOD OF FITTING A METAL CLOSURE

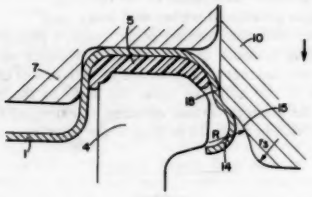
Bernard Houdayer; Bernard Le Fur, both of La Fleche; René Meneghin, Voiron, and Jean-Michel Monlod, Paris, all of France, assignors to Cebal, Clichy, France

Filed Apr. 2, 1984, Ser. No. 595,704

Claims priority, application France, Apr. 13, 1983, 83 06323

Int. Cl.⁴ B21D *39/03*

U.S. Cl. 413—2 **9 Claims**



1. A method for fitting a metal closure on a vessel having a circular edge comprising a rigid beaded lip (4), by means of fitting apparatus comprising a centering press (7) and an annular mandrel means (10) comprising an inclined inner curved profile (15) and a vertical inner surface, comprising the steps of:

(a) forming a closure blank (1) comprising a central depression (2) with a lateral wall (9) of substantially truncated conical shape and with a diameter slightly smaller than the diameter of the mouth of the vessel, and an annular toroidal section (3) which comprises in immediate succession:

an annular support section (20) generally perpendicular to said lateral wall,

an intermediate section (18) inclined outwardly and downwardly with respect to said annular support section, and

an outer edge (14) curved inwardly and downwardly with respect to said intermediate section and bent through an angle of 100° to 140°, with, in axial section, an inner radius of curvature of between 0.5 times and 0.8 times the radius of a circle which contains the outer contour of the edge of said beaded lip;

(b) positioning a thick endless elastic gasket (5) on the inside of the support section (20) of the closure blank (1);

(c) positioning the closure blank (1) under the centering press (7) of the fitting apparatus, and positioning the vessel beneath the closure blank (1);

(d) progressively pressing the closure blank (1) with its thick elastic gasket (5) onto the rim (6) of the vessel with the aid of the centering press (7) until a predetermined pressure is reached;

(e) during and after said step (d), shaping, fitting and tightening the closure blank (1) to seal on to the lip (4) of the vessel, by means of said annular mandrel means (10) according to the shaping steps of:

(e1) stretching, forcing downwardly and tightening the bent outer (14) and the intermediate section (18) by the pressure of the annular mandrel means (10) on said bent outer edge (14), and by the rolling of said edge in the inclined inner curved profile (15) of said annular mandrel means (10);

(e2) continuing this shaping of the outer edge (14) and of the intermediate section (18) of the closure blank (1), and at the same time forcing the extremity (19) of said outer edge (14) under the beaded lip (4) of the vessel by the upper engaging surface above said inclined inner curved profile and by the engaging of the vertical inner surface (16) of said annular mandrel means (10) around said outer edge and intermediate section (14+18);

(e3) achieving the sealed fitting of the closure (1) on the beaded lip (4) of the vessel by its being forced by the camming action of the vertical inner surface (16) of the annular mandrel means (10) around the outer edge (14+18) of the closure (1), this beig done at least until the bottom of the said vertical surface (16) reaches a level below the beaded lip (4) of the vessel.

4,555,209

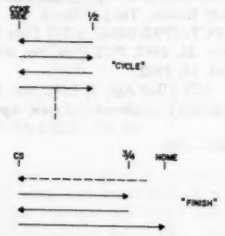
SEMI-AUTOMATIC PUSHER MACHINE LEVELER BAR CONTROL AND METHOD

Joseph W. Berenato, III, Bethesda; Earl L. Raivel, Jr., Baltimore, and John J. Strepelis, Forest Hill, all of Md., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 508,775, Jun. 29, 1983, abandoned. This application Apr. 24, 1984, Ser. No. 602,273

Int. Cl.⁴ C10B *31/02, 37/02*

U.S. Cl. 414—163 **15 Claims**



1. The method of distributing coal charged into a coke oven from a charging car on an upper level of the coke oven, said oven including spaced oven walls and a coke side door removably mounted at one end of said oven and a pusher side door removably mounted at an opposite end of said oven, said pusher side door includes a leveller bar door aligned with the coal line of the oven, and a leveller bar adapted for distributing the coal is movably disposed on an associated pusher machine adjacent the pusher side door, comprising the steps of:

(a) supplying said charging car with a predetermined supply of coal;

(b) charging a pre-determined portion of said supply into said oven for thereby partially charging said oven;

(c) opening said leveller bar door;

(d) positioning said leveller bar in said oven generally a pre-determined distance from said pusher side door;

(e) commencing charging the coal remaining in said charging car into said oven;

(f) moving said leveller bar to generally said coke side door;

(g) repeatedly cycling said leveller bar between said coke side door and generally midway of said oven while said charging continues and thereby distributing said coal in said oven;

(h) moving said leveller bar a pre-determined number of strokes between said pusher side door and generally said coke side door for thereby levelling said coal along generally said coal line;

(i) withdrawing said leveller bar; and,

(j) closing said leveller bar door.

7. A control system for the movable leveller bar of a coke oven pusher machine, comprising:

(a) means for moving said pusher machine;

(b) drive means operatively associated with said leveller bar for reciprocally moving said leveller bar between a retracted position associated with said pusher machine and an extended oven position;

(c) control means associated with said drive means and adapted for selecting any one of off, cycle and finish leveller bar movement configurations;

(d) manual control means operatively cooperating with said drive means and associated with said control means when in said off configuration and adapted for selectively moving said leveller bar;

(e) cycle control means operatively cooperating with said drive means and associated with said control means when in said cycle configuration and adapted for providing continuous reciprocal movement of said leveller bar between said oven position and a first pre-selected position intermediate said oven and said retracted of positions;

(f) position sensing means associated with said leveller bar and connected to said cycle control means for monitoring said leveller bar movement and communicating said leveller bar movement to said cycle control means for thereby permitting control of said leveller bar movement;

(g) finish control means operatively cooperating with said drive means and associated with said control means when in said finish configuration and adapted for providing a pre-determined movement configuration of said leveller bar between said oven and retracted positions;

(h) said position sensing means communicating with said finish control means for thereby permitting control of said leveller bar movement; and,

(i) interlock means associated with said means and said position sensing means for preventing movement of said pusher machine when said leveller bar is moved from said retracted position.

4,555,210

SPREADER DEVICE IN A STORAGE CONTAINER FOR UNIFORM FILLING OF THE CONTAINER WITH GRANULAR STORAGE GOODS

Stig Wigram, Nationsgatan 16, S-223 63 Lund, Sweden

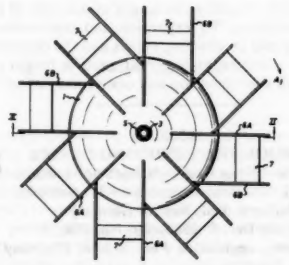
PCT No. PCT/SE83/00060, § 371 Date Oct. 19, 1983, § 102(e) Date Oct. 19, 1983, PCT Pub. No. WO83/02873, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 22, 1983, Ser. No. 552,131

Claims priority, application Sweden, Feb. 23, 1982, 8201113

Int. Cl.[4] A01F *25/18*

U.S. Cl. 414—301 **5 Claims**



1. A spreader device in a storage container, such as a silo compartment, for uniform filling of the container with granular storage goods, including a generally conical body (1) which is suspended for rotation about its longitudinal, vertical axis in the container directly below the mouth of the fill spout (2) of the container with the upper narrow end of said body facing said fill spout mouth, said body forming the bottom of a number of similar upwardly open channels defined by spaced boundary walls that extend beyond the periphery of said body, said channels being distributed regularly over the outer side of said body in the peripheral direction thereof and open at the lower end of said body, each of said channels being equipped with a transverse blade (7) fixed to the lateral boundary walls (6A, 6B) thereof radially outwardly of the lower end of said body, said blades (7) being positioned at different degrees of inclination to the longitudinal axis of said body and serving as baffles for deviating the stream of material at the end of each channel downwardly.

4,555,211

TRUCK LOCKING DEVICE

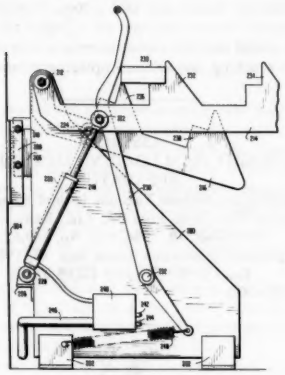
Donald L. Metz, 7459 Song Lake Rd., Tulley, N.Y. 13159

Continuation-in-part of Ser. No. 387,314, Jun. 11, 1982, Pat. No. 4,400,127, which is a continuation-in-part of Ser. No. 356,006, Mar. 8, 1982, abandoned. This application Jun. 14, 1982, Ser. No. 504,337

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.[4] B65G *67/02, 69/00;* **G05G** *5/06*

U.S. Cl. 414—401 **5 Claims**



1. A truck locking device comprising support means adapted to be secured on a suitable suport surface, horizontally extending pivot means secured to said support means, locking arm means having at least one projection thereon pivotally mounted on said pivot means, operating means connected to said locking arm means for moving said locking arm means upwardly for engagement with a horizontally disposed bar secured to a truck, an activating arm means pivotally mounted on said support means, control means engageable by said activating arm means for operatively controlling said operating means whereby upon engagement of said bar with said activating arm means said activating arm means will be pivoted to cause said control means to initiate operation of said operating means to move said locking arm means upwardly into locking engagement with said bar to secure the truck in position relative to said support means.

4,555,212

APPARATUS FOR RUPTURING CARRIER BAGS

Robert C. Jones, P.O. Box 27, Napoleon, Ohio 43545

Continuation of Ser. No. 402,304, Jul. 27, 1982, abandoned. This application Dec. 24, 1984, Ser. No. 685,596

Int. Cl.[4] B65B *69/00*

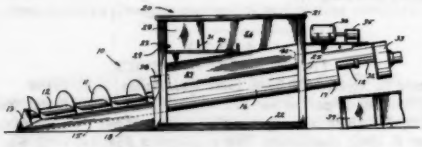
U.S. Cl. 414—412 **1 Claim**

1. An apparatus for rupturing carrier bags to expose the contents therein comprising:

an elongate transport trough including an inlet end portion and an outlet end portion;

screw impeller means rotatably supported in said transport trough for advancing carrier bags placed therein toward said outlet end portion of said transport trough;

first rupturing means spaced from said inlet end portion and disposed adjacent said screw impeller means for rupturing the carrier bags as the bags are advanced past said first rupturing means;



second rupturing means spaced between said first rupturing means and said outlet end portion and disposed adjacent said screw impeller means for rupturing the carrier bags as the bags are advanced past said second rupturing means; and

means positioned above said transport trough between said first rupturing means and said second rupturing means for enabling the carrier bags and the exposed contents thereof having passed said first rupturing means to expand upwardly prior to reaching said second rupturing means.

4,555,213

DAYLIGHT FILM LOADING METHOD AND APPARATUS

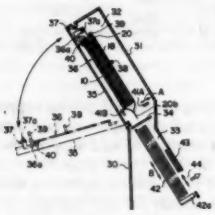
Kaoru Tamura, and Sadami Yamada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 10, 1984, Ser. No. 569,623

Claims priority, application Japan, Jan. 10, 1983, 58-1953

Int. Cl.⁴ G11B *1/00*; G03B *41/16*

U.S. Cl. 414—412 **9 Claims**



1. A daylight film loading method comprising:

(i) forming a clamp notch in a predetermined position of a side edge of an unexposed light-sensitive film,

(ii) forming a film package containing a stack of such notched films in a flexible light-tight envelope,

(iii) holding said film package in a vertical position in a loading chamber shielded from light, and holding the stack of said films by a clamp member in engagement with said clamp notch,

(iv) opening a lower end of said light-tight envelope and then moving said films and said light-tight envelope relative to each other in the vertical direction until at least the lower ends of said films are projected from a lower end of said light-tight envelope while said films are held by said clamp member,

(v) disengaging said clamp member from said clamp notch to release the clamping of said films, and

(vi) feeding said films to the next process.

4,555,214

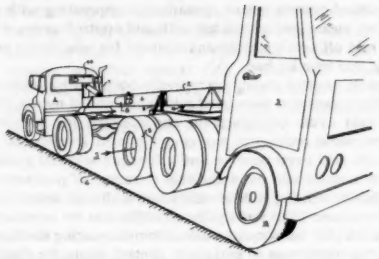
TOW BAR FOR SEMI-TRACTORS HAVING TRIANGULATED SUPPORT SYSTEM AND ADJUSTABLE DUAL CYLINDER HYDRAULIC CONTROL

James F. Morton, 3800 Cheryl St., Bucyrus, Ohio 44820

Filed Dec. 20, 1982, Ser. No. 450,974

Int. Cl.⁴ B60P *3/12*

U.S. Cl. 414—563 **5 Claims**



1. A dismounting towing apparatus for semi-tractors in which oppositely facing semi-tractors are maintained in a connected towing relationship by means of a king pin engagement to the fifth wheel each of a first towing semi-tractor and a second towed semi-tractor, the improvement being a tow bar comprising:

a single beam connection between a king pin fifth-wheel engagement means of the respective first and second semi-tractors,

said single beam extending in length from the king pin connection of the first semi-tractor to a first end point forward of said king pin connection and including at the said first end segment of the beam a means for selectively raising and lowering the opposite end of said beam to facilitate a connection of the king pin at the opposite end of the beam to to the fifth wheel of the second semi-tractor;

said means for selectively raising and lowering including a first expanding and contracting means extending as one side of a triangle in a triangular relationship defined by

(a) a first point above the extending forward end point of the beam;

(b) a second point approximately adjacent the king pin connection, and

(c) a third point at the forward extending end of the beam; and in which triangular relationship, the first point above the forward end of the beam is fixedly connected at a point forward of said beam end to the frame of the first semi-tractor; whereby the length of one side of the triangle is determined by expansion and contraction of the expanding and contracting means and the opposite end of the beam is correspondingly adjusted in height in accordance with the expansion and contraction of said means.

4,555,215

SPOOL TRANSPORTING DEVICE

Hans Raasch, and Hans Grecksch, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 558,201

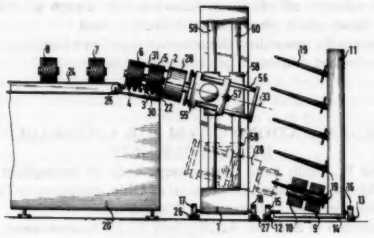
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244925

Int. Cl.⁴ B65H *67/00*

U.S. Cl. 414—564 **16 Claims**

1. Spool transporting assembly for the sequential transfer of textile spools wound on tubes, comprising a spool preparation station having a support surface for textile spools, a spool receiving device, and a spool transporting device for transporting textile spools from said spool preparation station to said spool receiving device, said spool transporting device includ-

ing a gripper head being movable in at least one plane into and out of a centered spool receiving position being fixed relative to said spool preparation station, said gripper head including gripper elements for gripping textile spools of different diameters in said centered spool receiving position, said gripper head having a given longitudinal axis, said gripper elements being in the form of at least three gripper arms aligned parallel to the



surface of the textile spools, said gripper arms being movable toward the longitudinal axis into a minimally open position and away from the longitudinal axis into a maximally open position, and said gripper head being movable into said spool receiving position relative to said spool preparation station wherein at least one of said gripper arms is disposed in said maximally open position substantially at the height of said support surface adjacent one of the textile spools.

4,555,216

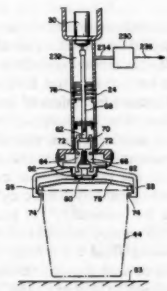
WORKPIECE HOLDING AND POSITIONING MECHANISM AND SYSTEM

Josef J. Buschor, San Jose, Calif., assignor to Five X Corporation, Santa Clara, Calif.

Filed Nov. 21, 1983, Ser. No. 553,534

Int. Cl.[4] B66C *23/18*

U.S. Cl. 414—728 **13 Claims**



1. A workpiece holding mechanism, which comprises a pair of opposing grippers movable from an open position laterally to a closed position for engaging the workpiece, locking means movable between a first position to lock said grippers in the closed position and a second position to lock said grippers in the open position, actuating means for moving said locking means between the first position and the second position, said actuating means including a solenoid actuated rod, first and second pivotable and opposed lever members each being attached to one of said pair of grippers to move said grippers between the open and closed positions, said locking means being attached to said rod, and said locking means including a first portion dimensioned and configured to fit between said first and second pivotable lever members and a second portion dimensioned and configured to fit on either side of said pivotable lever members to lock said grippers in the open and closed positions, biasing means in opposition to said actuating means and urging said locking means toward the first position, and means responsive to upward force imparted by the workpiece engaged by said grippers for moving said grippers to the open position, said upward force responsive means also holding said grippers in the open position in absence of the workpiece in said grippers.

4,555,217

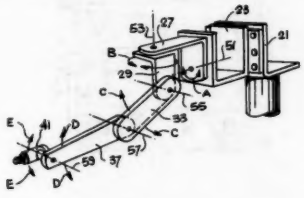
ROBOT ARM WITH SPLIT WRIST MOTION

Allen J. Wright, Corvallis, Oreg., assignor to Intelledex Incorporated, Corvallis, Oreg.

Continuation of Ser. No. 456,310, Jan. 6, 1983, abandoned. This application Jan. 11, 1985, Ser. No. 690,828

Int. Cl.[4] G05J *17/00*

U.S. Cl. 414—735 **2 Claims**



1. A robot arm of the anthropomorphic type having shoulder, elbow and wrist joints comprising,

a base, an upper arm, a lower arm and a tool interface,

a shoulder joint connecting the base to a first end of the upper arm, the shoulder joint having an upper arm sweep axis, an upper arm swivel axis perpendicular to the sweep axis and an upper arm roll axis, perpendicular to both the sweep and swivel axes, the roll, sweep and swivel axes intersecting at a fixed common point,

an elbow joint connecting a second end, opposite the first end, of the upper arm to a first end of a lower arm, said elbow joint having an extension axis parallel to the swivel axis of the shoulder joint, and

a biaxial wrist joint connecting a second end, opposite the first end, of the lower arm to the end effector, the wrist joint having a pitch axis parallel to the extension axis of the elbow joint and the swivel axis of the shoulder joint, whereby wrist joint roll motion is achieved by roll motion of the shoulder joint, said shoulder joint comprising a first bracket cantilevered from the base parallel to said roll axis, said frame having an overhang portion with an end region defining said sweep axis in vertical alignment therethrough and a second bracket having a first portion through which said sweep axis passes and a spaced apart region through which the plane formed by the swivel and roll axes passes.

4,555,218

TURBO MACHINE OF THE ROTODYNAMIC TYPE

Arne Jonsson, Hagfors; Sigurd Nyman, Ekshärad; Eskil K. Olelind, Sundbyberg, and Björn Olofsson, Märsta, all of Sweden, assignors to Jonsson Pumpkonsult, Hagfors, Sweden

PCT No. PCT/SE83/00347, § 371 Date Apr. 30, 1984, § 102(e) Date Apr. 30, 1984, PCT Pub. No. WO84/01406, PCT Pub. Date Apr. 12, 1984

PCT Filed Oct. 4, 1983, Ser. No. 610,294

Claims priority, application Sweden, Oct. 6, 1982, 8205692

Int. Cl.[4] F03D *3/04*

U.S. Cl. 416—17 **11 Claims**

1. A rotodynamic machine with a rotor comprising:

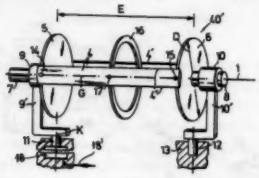
at least one elongate vane adapted to orbit an at least approximately circular path about a rotational axis of the rotor;

respective end pieces operatively engaging said vane and rotatable about respective centers located on said rotational axis;

means connected with said end pieces for conformably inclining same about inclination axes perpendicular to said rotational axes and adapted to vary the inclination of said end pieces during rotation of said rotor in operation, a medium traversing said rotor through the entire orbit of said vane in a given flow direction generally transverse to said rotational axis and said vane; and

respective pivot means connecting each of said end pieces to a respective end of said vane, each of said pivot means including:

means defining a first pivot axis between the respective



end piece and said vane and having a fixed relationship to the respective end piece, and

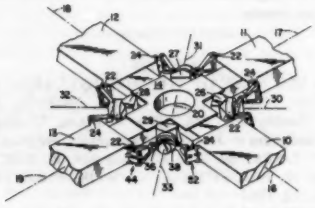
means defining a second pivot axis between the respective end piece and said vane which lies substantially at a right angle to the respective first pivot axis, is oblique to a longitudinal plane through said vane and includes an angle between substantially 5° and 85° or between substantially 95° and 175° with a longitudinal dimension of said vane, whereby said vane continuously alters its angular orientation with respect to said direction of flow in such manner that in all positions of said vane, a line perpendicular to said plane passes through a control point offset from said rotational axis by an amount determined by the inclination of said end pieces to said rotational axis.

4,555,219

HUB-MOUNTED ACTUATORS FOR BLADE PITCH COLLECTIVE CONTROL

Philip A. E. Jeffery, Trumbull, and Greg R. Luecke, New Haven, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 23, 1984, Ser. No. 644,001
Int. Cl.⁴ B64C *27/76*
U.S. Cl. 416—158 **5 Claims**



1. A rotor system comprising:

a rotorshaft that rotates relative to an airframe;

a hub attached for rotation to the rotorshaft;

blades attached to the hub in a manner to allow for blade pitch changes about respective blade pitch axes; and

means for providing a desired collective pitch input to the rotor system;

characterized by:

actuators mounted to the hub between adjacent blades, each actuator attached to the leading edge of one adjacent blade and to the trailing edge of the other adjacent blade for causing a corresponding pitch change in the adjacent blades in response to an actuator input, wherein all of the actuators act in unison so that the blade pitch changes are collective; and

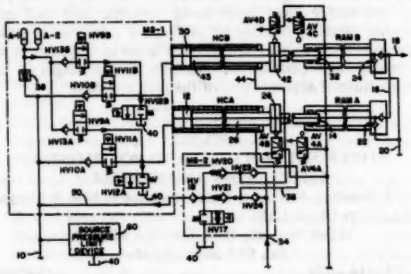
means for providing the actuator input as a function of the desired collective pitch input.

4,555,220

REGENERATION SYSTEM FOR A HYDRAULIC INTENSIFIER UNIT

Richard W. Hall; Sven Sonnenberg, both of Springfield, and Harbhajan S. Mahal, Dayton, all of Ohio, assignors to Towler Hydraulics, Inc., Milwaukee, Wis.

Continuation of Ser. No. 92,245, Nov. 7, 1979, abandoned. This application Jan. 28, 1982, Ser. No. 343,141
Int. Cl.⁴ F04B *17/00*
U.S. Cl. 417—342 **9 Claims**



1. In a hydraulic intensifier unit for use in oil well fracturing, erosion drilling or the like, in which a pair of working rams are sequentially operated by a corresponding pair of hydraulic cylinder motors each having a piston forming a working face side and an opposed return face side of lesser operative area than said working face side, a source of hydraulic fluid for supplying fluid to said working face side of said motors, and said pistons of said motors being movable between retracted and extended positions, the improvement comprising:

valve means connecting said hydraulic cylinder motors with said fluid source for selectably (1) receiving fluid from said return face side of said motors and supplying it to said source for increasing fluid flow from said source to the working face side of said motors during movement from said retracted position to said extended position, or (2) for expelling fluid from said return face side and not returning it to said source during movement from said retracted position to said extended position; and

means for supplying hydraulic fluid to said return face side of said motors to move said pistons to said retracted position.

4,555,221

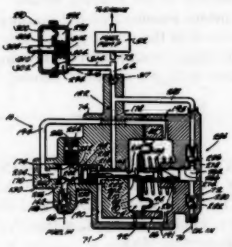
FLUID PUMPING DEVICE FOR USE WITH A FLUID PUMP

Chester G. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 540,045, Oct. 7, 1983. This application Jan. 23, 1984, Ser. No. 573,302
Int. Cl.⁴ F04B *43/06*
U.S. Cl. 417—349 **25 Claims**

1. A fluid pumping arrangement including a fluid pump

including a suction port, and a fluid pumping device comprising a pump housing defining a recess, a moveable wall which is located in said recess and which cooperates with said recess to define a variable volume pumping chamber, biasing means for moving said moveable wall in one direction, a fluid outlet communicable with said fluid pumping chamber and communicating with said suction port so that suction present at said suction port communicates with said fluid pumping chamber and thereby moves said moveable wall in the opposite direction against the action of said biasing means when said fluid pumping chamber is in communication with said fluid outlet, a fluid inlet communicable with said fluid pumping chamber and adapted to communicate with a source of fluid, means for selectively controlling communication of said fluid pumping chamber with said fluid outlet and with said fluid inlet, and means responsive to movement of said moveable wall for pumping a second fluid and comprising a bore which is in said



pump housing and which extends perpendicularly from said moveable wall and which partially defines a second variable volume fluid pumping chamber, a piston which is received in said bore and which includes a first end and a second end, said first end being attached to said moveable wall and said second end cooperating with said bore to form said second variable volume fluid pumping chamber, a second fluid inlet in communication with said second fluid pumping chamber and adapted to communicate with said second fluid pumping chamber and adapted to communicate with a second source of fluid, check valve means in said second fluid inlet for permitting fluid flow into and preventing fluid flow from said second fluid pumping chamber, a second fluid outlet in communication with said second fluid pumping chamber and adapted to communicate with said suction port, and check valve means in said second fluid outlet for permitting fluid flow from and preventing fluid flow into said second fluid pumping chamber.

4,555,222

AIR-OPERATED DIAPHRAGM PUMP AND A VALVE ARRANGEMENT THEREFOR

Joseph C. Casilli, Waldwick, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 23, 1983, Ser. No. 564,947

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—393 **12 Claims**

1. A limiting valve assembly for use with a reciprocating member and a pressurized medium user, comprising:

a housing having a bore which opens toward the movable member;

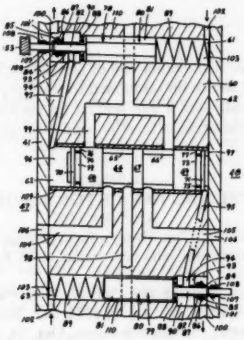
a limiting valve assembly accommodated in said bore and including a valve member guided in said bore for movement in opposite axial directions between two end positions and having a stem portion projecting from said bore into the path of movement of the movable member to be moved by the latter from one of said end positions toward the other, axially spaced first and second confining portions at the region of said stem portion, and a spring urging said valve member toward said one end position;

means for supplying a pressurized gaseous medium to a first region of said bore;

means for discharging gaseous medium from a second region of said bore that is axially spaced from said first region;

means for communicating a third region of said bore that is situated between said first and second regions with the user; and

means in said bore for sealingly separating said communicating means from said supplying means in said one end position, and from said discharging means in said other end position, of said valve member, including an annular element stationarily mounted in the respective bore at said third region and situated between said confining portions of the respective valve member, said annular element having a central passage through which said stem portion passes with clearance and a substantially radial passage



that connects said central passage with said communicating means, each of said two sealing elements being arranged around said stem portion at a different axial side of said annular element and between the latter and the respective confining portion to be confined therebetween and sealingly interrupt communication of said communicating means with said supplying means in said one, and with said discharging means in said other of said end positions of said valve member, and to become spaced therefrom and allow communication of said communicating means with said discharging means in said one, and with said supplying means in said other, of said end positions of said valve member to thereby alternately admit the pressurized gaseous medium to and discharge the gaseous medium from the user.

4,555,223

RADIAL PISTON MACHINE

Ludwig Budecker, and Georg Obersteiner, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 365,676, Apr. 5, 1982, abandoned. This application May 3, 1984, Ser. No. 605,996

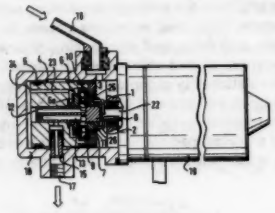
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121528

Int. Cl.[4] F04B *19/20, 29/00*; F16J *9/00*

U.S. Cl. 417—462 **1 Claim**

1. A radial piston machine for transmitting fluid therethrough, said machine comprising a stator, a rotor disposed in said stator and rotatable on a stationary control pintle having supply and discharge channels, a radial through-bore in said rotor adapted for periodic connection to said supply and discharge channels, said through-bore containing a first and a second radially displaceable spherical piston disposed at opposite ends of the bore on opposed sides of the control pintle, each piston including a radially outwardly disposed ball seated in a radially inwardly disposed unitary cylindrical sleeve, with each piston radially slidable relative to a cam surface on said stator, each said sleeve comprising a cylindrical outer wall of

uniform diameter and circumference each sleeve including an axially concentric through passage having a conic seat for its associated ball at one end to provide a line contact therewith, and in which said passage bounds an outwardly tapering wall



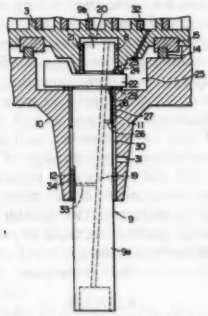
of said sleeve at the other end of said sleeve forming a peripheral integral sleeve lip positioned to sealingly engage the adjacent bore wall with a gap sealing lip responsive to pressure above a predetermined level passing through said passage.

4,555,224

OIL FEEDING DEVICE FOR SCROLL FLUID APPARATUS

Eiichi Hazaki, Shimizu; Masaya Imai, Ibaraki; Kenji Tojo, and Masao Shibayashi, both of Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 315,495, Oct. 27, 1981, Pat. No. 4,462,772. This application May 2, 1984, Ser. No. 606,223
Claims priority, application Japan, Oct. 31, 1980, 55-152077
Int. Cl.[4] F01C *1/04, 21/04*
U.S. Cl. 418—55 **6 Claims**



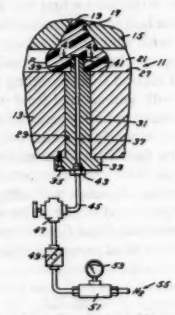
1. A scroll fluid apparatus comprising:
a fixed scroll member having an end plate located in an upstanding position on the end plate;
an orbiting scroll member having an end plate and a wrap located in an upstanding position on the end plate of the orbiting scroll member and engaging with the fixed scroll member to form a plurality of sealed spaces therebetween;
frame means connected to the fixed scroll member;
first and second bearing means mounted on the frame means;
a crankshaft having a shaft portion and a crank portion, said crank portion engaging with the orbiting scroll member through the first bearing means and said shaft portion being rotatably supported by the second bearing means;
balance weight means formed on the crankshaft and located between the shaft portion and the crank portion;
an intermediate chamber defined by the frame means and the end plate of the orbiting scroll member;
small opening means through which the intermediate chamber communicates with the sealed spaces;
an oil chamber defined by an end surface of the crank portion and the end plate of the orbiting scroll member;
an oil feeding passage means formed in the crankshaft and extending from an end of the shaft portion to the end surface of the crank portion, said oil feeding passage means communicating with the oil chamber;
an Oldham's ring and key means arranged between the frame means and the end plate of the orbiting scroll member for preventing the orbiting scroll member from rotating on its own axis;
drive means connected to the crankshaft;
sealed housing means defining a chamber for accommodating all the previous elements, said chamber defined by said housing means being isolated from said intermediate chamber;
an outlet port means formed in the fixed scroll member for enabling the sealed spaces to communicate with said chamber defined by the housing means;
suction pipe means mounted on the housing means so as to communicate with the sealed spaces; and
discharge pipe means mounted on the housing means so as to communicate with the chamber defined by the housing means.

4,555,225

APPARATUS FOR MAKING A TWIN-WALL, INTERNALLY CORRUGATED PLASTIC STRUCTURAL PART WITH A SMOOTH NON-CELLULAR SKIN

James W. Hendry, Englewood, Tenn., assignor to Lang Fastener Corporation, Roseville, Mich.

Division of Ser. No. 381,105, May 24, 1982, Pat. No. 4,474,717. This application Sep. 26, 1984, Ser. No. 654,433
Int. Cl.[4] B29C *17/04*
U.S. Cl. 425—4 R **24 Claims**



1. Apparatus for making a twin-wall, internally corrugated plastic structural part having a smooth, dense, solid, thin walled, non-cellular skin comprising a pair of mold members defining, when closed, a sealed cavity;
one of said mold members including an opening means through which plastic material is adapted to be injected into said cavity;
and probe means having a bore projected therethrough and mounted upon the other of said mold members, said probe means having one end located outwardly of said other mold member and adapted to be connected to a source of pressurized inert gas;
and said probe means having its other end located opposite from and facing said opening means and communicating with the mold cavity for injecting the gas under pressure into the mold cavity, first means for causing introduction of plastic material into said opening means; second means for causing the introduction of gas into said probe means whereby a small amount of the plastic material first introduced into said cavity by said first means is pressurized by

the gas introduced by said second means, thereby forming the skin against the walls of said mold cavity and thereafter the progressive commingling of the inert gas under pressure from said second means with additional plastic material from said first means filling the cavity and forming an internal corrugated body integral with and bonded to said skin.

4,555,226

APPARATUS FOR ROLLING DOUGH AND COILING IT

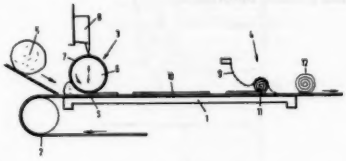
Johan Benier, Vught, Netherlands, assignor to Benier B.V., 's-Hertogenbosch, Netherlands

Filed Dec. 27, 1982, Ser. No. 453,179

Claims priority, application Netherlands, Dec. 29, 1981, 8105893

Int. Cl.⁴ A21C *3/02, 3/06*

U.S. Cl. 425—96 **5 Claims**



1. A dough make-up machine having roller means for rolling out dough balls to flat slabs and coiling means for subsequently coiling the slabs to produce homogeneous cylinders for further processing in a bakery, said machine comprising a dough carrier having a smooth carrying surface for carrying the slabs from the roller means to the coiling means, said roller means having a rough, porous moisture retaining surface for rolling out dough balls on said smooth carrying surface to cause the formed slab to adhere to the surface so that the surface prevents elastic shrinking of the flat slab, and means for wetting the roller surface so that during the rolling out operation water is forced into the free surface of the slab where the surface structure of the dough is slightly disturbed by the rolling out force applied to the dough by said roller, whereby the entire dough surface and its adjacent subsurface are caused to accept moisture in a quantity such that when the slabs are subsequently coiled to cylinders there is sufficient moisture between the windings to allow them to fuse together, such fusion being further contributed to bey shrinkage of the slabs upon release from the carrier resulting in a tightening of the formed dough rolls.

4,555,227

DEVICE FOR INJECTION MOULDING INSULATING DISKS ONTO THE INNER CONDUCTOR OF HIGH-FREQUENCY COAXIAL CABLES

Hans L. Ditscheid, Bergisch Gladbach, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

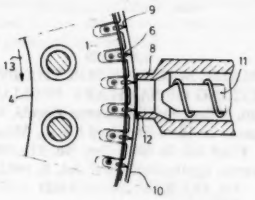
Filed Jul. 5, 1984, Ser. No. 628,013

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324348

Int. Cl.⁴ B29D *23/05*

U.S. Cl. 425—122 **6 Claims**

1. A device for injection molding insulating discs onto the inner conductor of a high-frequency coaxial cable comprising a turret rotatable about its axis and at the circumference of which are located radially arranged mold cavities provided with radially arranged molding ducts extending outwardly from said circumference forming said insulating discs, means for moving said conductor through the centers of said mold cavities, means for opening and closing said mold cavities, injection means for supplying molding material to said cavities comprising an injection nozzle directed toward the circumference of said turret and means for separating the molding material formed during the molding process on the circumference of said turret from said insulating discs, characterized in that the face of the injection nozzle facing the circumference of the turret is provided with an orifice which orifice is an oval shaped slot, the longitudinal direction of which slot extends along the circumferential direction of said turret and the longitudinal dimension of which slot is larger than the diameter of the molding ducts and the means for separating the film of molding material formed on the circumference of said turret from the insulating discs is so located in relation to the turret that it separates the film of molding material from the insulating discs in an area in which the mold cavities are closed.



4,555,228

APPARATUS FOR AUTOMATICALLY EXCHANGING DIE FOR INJECTION MOLDING

Naritoshi Nishiike; Takashi Nishimaki, both of Chiba; Yasushi Miura, Yokohama, and Masaaki Kumamura, Ohita, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

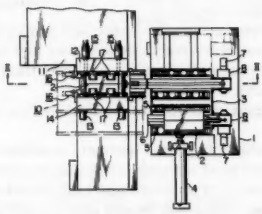
PCT No. PCT/JP83/00200, § 371 Date Feb. 22, 1984, § 102(e) Date Feb. 22, 1984, PCT Pub. No. WO84/00128, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 22, 1983, Ser. No. 588,871

Claims priority, application Japan, Jun. 22, 1982, 57-106107

Int. Cl.⁴ B29F *1/00*

U.S. Cl. 425—185 **5 Claims**



1. An automatic die exchanging apparatus for automatically exchanging a split die on an injection molding machine having a stationary platen and a movable platen arranged to move horizontally with respect to said stationary platen, said split die having a locking mechanism adapted to automatically lock the preset die half parts, said injection molding machine having a die mounting portion between said stationary platen and said movable platen and accessible by the locked split die from a lateral side of said injection molding machine, said automatic die exchanging apparatus comprising: a die exchanging base having at least two transfer passages adapted to carry a locked die, said die exchanging base being movable to alternatingly bring said transfer passages into alignment with said die mounting portion at said lateral side of said molding machine; a transfer means for transferring said locked die from the aligned transfer passage to said die mounting portion and vice versa; a locating means for locating said die transferred to said die mounting portion at a predetermined postion; a clamping means for fixing the die half parts of the located die to said

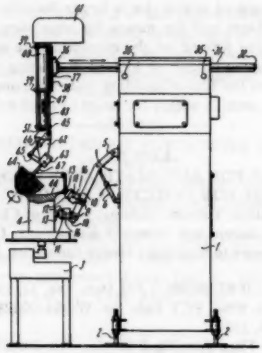
stationary platen and said movable platen of said molding machine; and means provided on one of said stationary and movable platens for releasing said locking mechanism to unlock said die half parts, said means being effective only when said die half parts are located to be fixed to respective platens.

4,555,229

AUTOMATIC MACHINE FOR THE INTERNAL FETTLING OF SANITARY APPLIANCES

Mario Biadigo, Milan, and Gianfranco Zucchi, Brescia, both of Italy, assignors to Ideal Standard S.p.A., Milan, Italy

Filed Jul. 8, 1983, Ser. No. 511,998
Claims priority, application Italy, Jul. 9, 1982, 46843 A/82
Int. Cl.⁴ B29C *25/00*; B44D *5/10*
U.S. Cl. 425—267 **11 Claims**



1. An apparatus for fettling the internal surface of a vessel which comprises:

a profile member configured to the shape of the internal surface of the vessel;

a tappet device arranged to trace said profile member;

a slide means operatively connected to said tappet device, the motion of said tappet device being transferred to said slide means;

a slider means mounted for vertical motion on said slide means;

an orientatable rotary head member connected to said slider means, said head member comprising a central shaft having a plurality of radial clamps, each of said radial clamps being fitted with a thin flexible strip of a soft weave or mat of slightly abrasive filiform plastic material; and

means for causing said head member to traverse the internal surface of the vessel in a stepwise rotary motion in conformity with the traversal of the profile member.

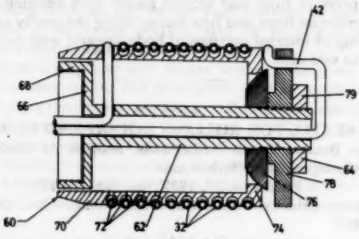
4,555,230

CALIBRATOR FOR USE IN THE MANUFACTURE OF DOUBLE WALLED THERMOPLASTIC PIPE

Manfred A. A. Lupke, 10 McLeary Ct., Concord, Ontario, Canada (L4K 2Z3)

Filed Mar. 7, 1984, Ser. No. 587,139
Claims priority, application Canada, May 27, 1983, 429064
Int. Cl.⁴ B29C *53/00, 53/56*
U.S. Cl. 425—325 **1 Claim**

1. In an apparatus for manufacturing thermoplastic pipes, a calibrator comprising an elongate carrier supporting a helical spring having a transitional deformation, said helical spring further having one end fixed to said carrier and an opposite end attached to a rotatable element so as to vary and fix the diameter of said spring by means of twisting said spring about said



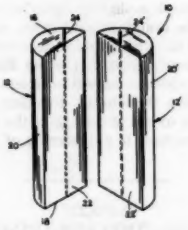
carrier and converting said transitional deformation of said spring into a radial deformation.

4,555,231

UNITY CANDLE

D. Lucinda Kustka, 1128 Surrey Rd., Papillion, Nebr. 68046

Filed Jan. 7, 1985, Ser. No. 689,335
Int. Cl.⁴ F23D *3/16*
U.S. Cl. 431—288 **8 Claims**



1. A unity candle, comprising

a pair of elongated upright candle sections, each having upper and lower ends, an exterior surface and an exposed interior engagement surface,

a pair of upright wicks, one on each of the respective candle sections and extended longitudinally thereof at a position substantially closer to the exposed interior engagement surface thereof than to the exterior surface thereof,

the engagement surface of each candle section being matched with the engagement surface of the other candle section such that, upon placement of the matched engagement surfaces in registered engagement, a single candle is formed, and

said wicks extending upwardly from the upper surfaces of said candle sections and being so positioned on the respective candle sections that, upon placement of the matched interior engagement surfaces in registered engagement and upon lighting of the wicks, flames from the separate wicks are merged into one.

4,555,232
HAIR DRYING APPARATUS

Edward R. Raccah, Southern Leigh, Blackberry La., Lingfield, Surrey, and James B. King, 5 Wardrobe Ct., 146a Queen Victoria St., London EC4V 5AT, both of England

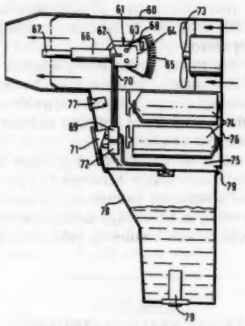
PCT No. PCT/GB82/00255, § 371 Date Apr. 12, 1983, § 102(e) Date Apr. 12, 1983, PCT Pub. No. WO83/00607, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 13, 1982, Ser. No. 486,538

Claims priority, application United Kingdom, Aug. 14, 1981, 8124971

Int. Cl.⁴ A45D *20/06*; F24H *1/00*

U.S. Cl. 432—222 **2 Claims**



1. Hair drying apparatus comprising a tubular body with an air inlet at one end, an electric motor at said end, an air impeller driven by said motor to draw air in through the air inlet, propel the air through the body and out through an outlet nozzle at the other end of the body, a heating means disposed within the body between said impeller and said air outlet nozzle, said heating means comprising a gas burner assembly including a coiled tube positioned within the air-flow, one end of the tube being fed with a combustible gas mixture, the tube having apertures spaced along its length, a fibrous catalyst material around the outside thereof, a support wire on which said fibrous catalyst material is retained, a housing secured to and beneath the body, the housing containing an electric power source connected through switch means to drive said electric motor, a gas flow valve operably coupled with the switch means and to a trigger mounted on the housing for manual operation, a pressurised liquid gas container connected with the housing and extending to form therewith a handgrip, a gas refilling valve assembly at the base of said gas container, a gas duct connecting the said container with the burner through said gas flow valve, ignition means to initiate combustion of the gases, and a temperature sensing means operable to close a valve in the gas feed when the burner temperature rises above a predetermined maximum.

4,555,233
SHOCK-ABSORBING BOW MOUNT FOR TROLLING MOTOR

Mark S. Klammer, and Del P. Decko, both of Mankato, Minn., assignors to Johnson Fishing, Inc., Mankato, Minn.

Filed Apr. 23, 1984, Ser. No. 602,772

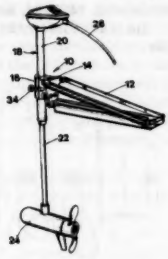
Int. Cl.⁴ B63H *21/26*

U.S. Cl. 440—56 **7 Claims**

1. In an electric trolling motor mounting device of the type having means for attachment to a boat, a tube-securing element connected to said attachment means and a tube structure held by the tube-securing element and having the motor at one end thereof for under water suspension during operation, the improvement, described in the in-water orientation, wherein:

said attachment means includes a substantially vertical bearing surface adjacent the tube-securing element;

an array of compressible springs held in partial compression between said bearing surface and said tube-securing element, said array being constituted by a group of at least two such springs disposed in spaced horizontal orientation and a second group including at least a third spring vertically spaced from a line between centers of the springs of said first group of springs; and



means associated with said attachment means and said tube-securing element to permit said tube-securing element to tilt relative to said vertical bearing surface upon the application of a lateral force to the motor;

whereby the shock of collisions between the motor and underwater objects may be absorbed by tilting of said tube structure and tube securing element relative to said bearing surface to compress the springs of one of said groups.

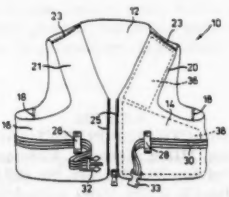
4,555,234
FLOTATION VEST CONSTRUCTION

David Kent, Guelph, Canada, assignor to Guelph Elastic Hosiery Company Limited, Guelph, Canada

Continuation of Ser. No. 536,377, Sep. 27, 1983, abandoned. This application Mar. 7, 1985, Ser. No. 709,200

Int. Cl.⁴ B63C *9/08*

U.S. Cl. 441—106 **7 Claims**

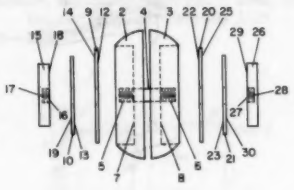


1. A flotation vest comprising a back panel, two front panels joined to the lower sides of the back panel, each front panel including a lapel portion extending upwardly to join the back panel at an upper corner thereof, each front panel defining with the back panel an armhole adjacent the respective lapel portion, each front panel having two layers of fabric defining between them a pocket extending continuously through the front panel including the respective lapel portion, and flotation material in each such pocket, said flotation material including:

a plurality of layers of buoyant, flexible material in each pocket below the respective lapel portion, and a single sheet of buoyant, flexible material in the respective lapel portion, said single sheet being gated by means of a plurality of substantially parallel, spaced-apart slits which extend short of the edges of the sheet, each slit passing entirely through the sheet so that the sheet remains joined only beyond the extremities of each slit, whereby the sheet

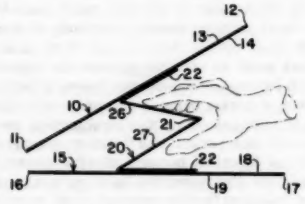
folds preferentially at said slits, said single sheet being folded to provide a plurality of juxtaposed layers connected at folds, whereby the folds prevent interleaving of said layers with said folded single sheet.

4,555,235
RETURN TOP
Robert C. Burroughs, 20400 Fredrick Rd., Germantown, MD 20874—Lot I-2
Continuation-in-part of Ser. No. 427,697, Sep. 29, 1982. This application Aug. 14, 1984, Ser. No. 620,319
Int. Cl.⁴ A63H *1/30, 1/22*
U.S. Cl. 446—250 **18 Claims**



5. A return top having a multiple designing means enabling a changing and replacing and repositioning of surface designs of said multiple designing means with the use of existing mounted parts without changing its geometrical structure, and means to revert said return top back to its original surface design with same said existing mounted parts, said multiple designing means mounted to a structure, said structure comprising a pair of substantially disk shaped parts and an axle connecting said pair of substantially disk shaped parts, said multiple designing means comprising stacked and removable and repositionable design dates of said pair of substantially disk shaped parts, there being at least two of said stacked and removable design washers associated with each said disk shaped part, each plate having separate designs on opposing faces enabling a changing and replacing and repositioning of face side up designs of said design washers by the reversing of said design washers said designs on face side up of said design washers being visible when stacked, said design washers secured with fastening means, said fastening means enabling the removal and replacing and repositioning of said design washers.

4,555,236
HAND ACTUATED PUPPET AND KIT
Jeffrey L. Peyton, 2218 E. Grace St., Richmond, Va. 23223
Filed Apr. 26, 1984, Ser. No. 603,912
Int. Cl.⁴ A63H *23/00, 3/14, 3/08*
U.S. Cl. 446—329 **10 Claims**



7. A kit in the form of a compact package amenable to commercial distribution comprising:

A. a hand actuated puppet fabricated substantially entirely of resilient thin flat sheet material and presenting the general appearance of the head of a person or animal, said puppet being comprised of:

(a) a flat upper panel representing the face of a person or animal and having front and rear extremities and upper and lower surfaces,

(b) a flat lower panel representing a lower portion of the person or animal and comprised of front and rear extremities and upper and lower surfaces, and

(c) a folded W-shaped hinge capable of being collapsed to a planar configuration, said hinge interengaging said upper and lower panels and disposed such that the outer legs of said W-shaped hinge are attached to opposing surfaces of said upper and lower panels inwardly of said front extremities, said inner legs forming a center bight directed toward the rear extremities of said panels, said hinge having a width sufficient to facilitate holding by the fingers of the operator,

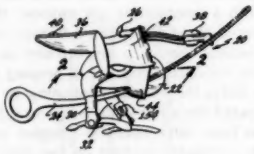
(d) said upper and lower panels being adapted to be hand-manipulated in a manner to cause them to bend and meet in abutting contact in a mutual plane at a site adjacent their front extremities, said site of abutting contact being capable of gripping flat objects,

(e) the design and construction of said puppet being such as to facilitate interconversion between an operational configuration and a flattened storage configuration,

(f) said puppet being in its storage configuration, and

(B) literary material whose content is related to the puppet's appearance.

4,555,237
WALKING AND ROLLING TOY
Teruo Nikaido, Tokyo, Japan, assignor to Tomy Kogyo Company, Incorporated, Japan
Filed Jul. 6, 1984, Ser. No. 628,527
Claims priority, application Japan, Nov. 25, 1983, 58-182379; Dec. 10, 1983, 58-190813
Int. Cl.⁴ A63H *3/22, 29/02*
U.S. Cl. 446—355 **16 Claims**



1. A movable toy which comprises:

a body;

a fly wheel rotatably mounted on said body;

means for rotating said fly wheel so as to energize said fly wheel;

appendage means for supporting and moving said toy on a support surface, said appendage means having ends, said appendage means pivotally connected to said body about one of said ends, the other of said ends of said appendage means contacting said support surface;

a member movably mounted on said body so as to move between a first and second position;

motion transfer means for transferring motion from said fly wheel to said appendage means, said motion transfer means operatively connectable between said fly wheel and said appendage means and further operatively associated with said member whereby when said member is in said first position said motion transfer means is connectable between said fly wheel and said appendage means and when said member is in said second position said connection between said fly wheel and said appendage means is disrupted;

said appendage means includes a first and second appendage

element, each of said appendage members having ends, each of said appendage elements pivotally connected to said body about one of their ends;

said motion transfer means includes a crank shaft rotatably mounted on said body and operatively associated with said fly wheel so as to be rotated by said fly wheel, said crank shaft being elongated and including ends, said crank shaft located on said body so as to extend through said body with the respective ends of said crank shaft extending out of respective sides of said body, said crank shaft including a crank on each of its respective ends, each of said cranks of a type including a crank pin connected by a web to said crank shaft, the crank pins on each of said cranks orbiting about said crank shaft in response to rotation of said crank shaft;

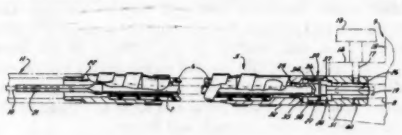
each of said appendage element having a first and second appendage member, said first appendage member having ends, said first appendage member rotatably mounted to the crank pin of the respective crank associated with said appendage element, said first appendage member executing movement in response to rotation of said crank shaft, said second appendage member having ends, said second appendage member pivotally mounted to said first appendage member, said second appendage member slideably connected to said crank shaft proximal to one of the ends of said second appendage member, said second appendage member pivoting on said first appendage member in response to rotation of said crank shaft.

4,555,238

FLEXIBLE SHAFT HAVING DETACHABLE END CONNECTIONS

William J. Miller, Hartford, and Norman Faber, Jr., Allenton, both of Wis., assignors to Wacker Corporation, Hartford, Wis.

Filed Oct. 29, 1984, Ser. No. 665,618
Int. Cl.[4] F16C *1/08*; F16D *3/00*
U.S. Cl. 464—52 **2 Claims**



2. A flexible shaft comprising an elongated sheath having front and rear ends and an elongated flexible core having front and rear ends, said core being endwise insertable into said sheath and removable therefrom and being normally rotatable in the sheath with its front and rear ends respectively adjacent to the front and rear ends of the sheath, the rear ends of said sheath and said core being detachably connectable, respectively, with a relatively nonrotatable housing of a driven device and with a rotatable driven shaft of said driven device, the front end of said core being readily detachably connectable with a rotatable driving shaft of a driving device, which shaft has a coaxial non-circular well therein, and the front end of said sheath being detachably connectable with a fixed annular part on a housing of the driving device, said part being coaxial to said driving shaft and spaced radially outwardly therefrom and having a lengthwise slidable detent pin extending radially therethrough that is biased towards the driving shaft, said flexible shaft being characterized by:

A. tubular front securement means for said sheath comprising front and rear tubular members detachably connected in coaxial telescoping relationship,

(1) said rear tubular member having a rear portion which is secured to the front end portion of the sheath,

(2) said front tubular member

(a) having a substantially cylindrical radially outer front surface portion that is axially receivable in said annular part of a driving device and

(b) having at least one radially opening hole therein wherein said detent pin is receivable to releasably lock the securement, means against movement relative to said annular part,

(3) each of said tubular members having a counterbore therein

(a) which opens axially towards the other tubular member and

(b) which defines an inner coaxial annular shoulder that faces axially towards the other tubular member, and

(4) one of said tubular members having a portion which is axially adjacent to the other tubular member and which is removably secured in the counterbore in said other tubular member to connect the tubular members with their said shoulders in axially spaced opposing relationship; and

B. rigid front connector means for said core having

(1) a rear portion secured to the front end portion of the core,

(2) a coaxial front end portion axially slidably receivable in said noncircular well to provide a readily detachable rotation transmitting connection between the core and said driving shaft, and

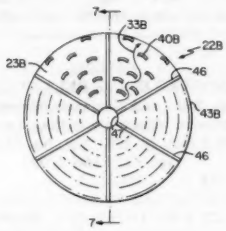
(3) a radially outwardly projecting circumferential flange rearwardly adjacent to its said front end portion that is received in the counterbore in said other of the tubular members to be axially slidable therein between limits defined by said shoulders.

4,555,239

BELT PULLEY AND METHOD OF MAKING THE SAME

Joseph P. Miranti, Jr., Porter Township, Christian County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jun. 1, 1982, Ser. No. 383,856
Int. Cl.[4] F16H *57/04*
U.S. Cl. 474—93 **12 Claims**



1. In a belt pulley having a hub and a peripheral groove for receiving part of an endless belt therein that is to drive said pulley or be driven thereby whereby said pulley is adapted to be rotated about the axis of said hub, said pulley having opposed sides, said pulley having vane means extending outwardly from at least one of said sides thereof, the improvement wherein said vane means comprise a plurality of spaced apart curved vanes of substantially the same size and shape and disposed in a plurality of circular arrays that are generally concentrically disposed relative to each other about said axis on said one side of said pulley for acting on fluid adjacent said pulley to tend to cool said pulley with said fluid, said curved vanes in each circular array each being disposed substantially evenly between an adjacent pair of curved vanes in the circular array adjacent thereto whereby the number of curved vanes in each circular array is the same, each curved vane having a convex side and a concave side, said concave side of each curved vane facing said axis and each curved vane being substantially symmetric about a radial line intersecting its midpoint and said convex side of each curved vane facing in the direction of said peripheral groove.

4,555,240

PULLEY FOR COGGED BELT AND METHOD FOR PRODUCING SAME

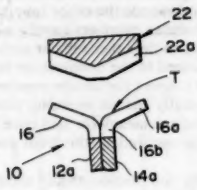
Yoshimasa Hayashi, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 22, 1982, Ser. No. 360,423

Claims priority, application Japan, Mar. 23, 1981, 56-40430[U]

Int. Cl.⁴ F16H *55/30, 55/12*

U.S. Cl. 474—152 **4 Claims**



1. In combination, a pulley for use with a cogged belt, and a cogged belt, said cogged belt having sides and cogs extending from one of said sides to the other of said sides, said pulley comprising:

first and second discs formed of sheet metal and secured with each other as a single unit, each disc being formed at its peripheral section with a plurality of teeth and having a main body, each tooth including a base portion integral with and extending radially outwardly from said main body, and a bent portion integral with said base portion, said discs being secured such that the bent portions of the teeth on said first and second discs extend in generally opposite directions, and such that said bent portions are engageable with said cogs of said cogged belt, said opposed bent portions and radially outwardly extending base portions of each tooth defining a continuous contact surface whereby there is engagement of each tooth with a cog of said belt across the full extent of each tooth.

4,555,241

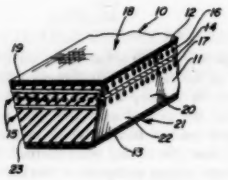
REINFORCED DRIVE BELT STRUCTURE

Hiroshi Takano, Miki, and Kunikatsu Shinoki, Kobe, both of Japan, assignors to Mitsuboshi Belting, Ltd., Kobe, Japan

Filed Dec. 20, 1982, Ser. No. 451,045

Int. Cl.⁴ F16G *1/00*

U.S. Cl. 474—261 **19 Claims**



1. In a V-belt having a rubber body defining outer and inner faces and a plurality of substantially parallel, low elongation, high strength tensile cords extending lengthwise longitudinally of the V-belt intermediate said faces, the improvement comprising:

a first plurality of filament reinforcing elements each extending substantially fully transversely across the body outwardly adjacent said tensile cords; and

a second plurality of filament reinforcing elements each extending substantially fully transversely across the body outwardly adjacent said tensile cords; and

a second plurality of filament reinforcing elements each extending substantially fully transversely across the body inwardly adjacent said tensile cords for preventing inward migration of the tensile cords, said reinforcing elements defining outer surfaces completely engaging the surrounding rubber body and thereby being connected to each other longitudinally of the belt solely by said rubber body whereby said tensile cords provide the sole control of the longtudinal extension of the belt thereat.

4,555,242

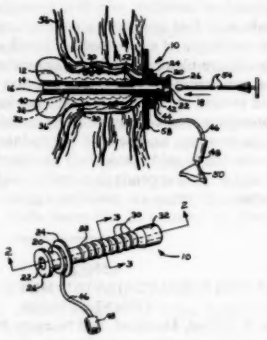
URINARY DRAINAGE APPLIANCE

Abdul S. Saudagar, 12 Eastshore, Irvine, Calif. 92714

Filed Jan. 19, 1984, Ser. No. 572,687

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 604—96 **19 Claims**



1. A device for draining bodily wastes from a natural or artificial bladder in a patient's body through a stoma connected with said bladder by a passage, said device comprising:

conduit means insertable into said bladder through said stoma and said passage, for allowing the passage of bodily wastes from said bladder to the exterior of the body through said stoma, said conduit means having a distal end adapted to be received in said bladder and a proximal end axially spaced from said distal end so as to extend to the exterior of the body through said stoma;

external retention means, attached to said proximal end of said conduit means, for sealing said stoma around said proximal end and forming an outlet for wastes discharged from said proximal end;

an inflatable balloon enclosing the exterior of said conduit means along a substantially portion of its length from said distal end thereof, said balloon having a bulbous tip portion surrounding said distal end and a ribbed portion extending proximally from said tip portion, said balloon and said conduit means defining a space therebetween; and

passage means, communicating with said space, for providing a flow path for a fluid into said space to inflate said balloon;

said balloon having a wall which is thicker in said tip portion than in said ribbed portion so as to allow said ribbed portion to be substantially fully inflated before said tip portion is inflated when said ribbed portion is situated in said passage and said tip portion is situated in said bladder.

8. A device for draining bodily wastes from a natural or artificial bladder in a patient's body through a stoma connected with said bladder by a passage, said device comprising:

a flexible tube insertable into said bladder through said stoma and said passage, and having a distal end adapted to be received in said bladder, a proximal end axially spaced from said distal end so as to extend to the exterior of the body through said stoma;

external retention means, attached to said proximal end of said tube, for (a) resisting axial displacement of said tube, (b) sealing said stoma around said proximal end, and (c) forming an outlet for the discharge of wastes flowing through said tube;

first inflatable means on said distal end of said tube, which, when inflated, extends radially outwardly from said distal end and axially beyond said distal end, for (a) resisting, with said external retention means, the axial displacement of said tube, (b) providing a fluid-tight seal around said distal end of said tube, and (c) providing a cushion around said distal end substantially to prevent direct contact between said tube and the tissues of said bladder;

second inflatable means, enclosing a substantial portion of the length of said tube extending proximally from said first inflatable means, for providing, when inflated, a substantially fluid-tight seal between said tube and said passage; and

passage means in said external retention means and said tube, for providing a flow path for a fluid into said first and second inflatable means for the inflation thereof;

said first and second inflatable means each having an expandable wall, the expandable wall of said first inflatable means being thicker than the expandable wall of said second inflatable means, so that said first inflatable means is permitted to begin inflating only after said second inflatable means is substantially fully inflated when said tube is inserted into said bladder through said stoma and said passage.

15. A device for draining bodily wastes from a natural or artificial bladder in a patient's body through a stoma connected with said bladder by a passage, said device comprising:

a flexible tube, insertable into said bladder through said stoma and said passage, and having a distal end adapted to be received in said bladder, a proximal end axially spaced from said distal end so as to extend to the exterior of the body through said stoma, and an axial bore extending from said distal end to said proximal end;

a retainer plug attached to said proximal end of said tube and having an axial bore aligned with the axial bore of said tube;

an inflatable balloon enclosing the exterior of said tube along a substantial portion of its length from the distal end thereof, said balloon having a bulbous tip portion surrounding the periphery of said distal end and a ribbed portion extending proximally from said tip portion, said balloon and said tube defining a space therebetween, said bulbous tip portion being inflatable to form a donut-shaped cushion extending radially outwardly from said distal end and axially beyond said distal end, said ribbed portion being inflatable to form a substantially fluid-tight seal between said tube and said passage, said balloon having an expandable wall which is thicker in said tip portion than in said ribbed portion, thereby allowing said ribbed portion to be substantially fully inflated before said tip portion is inflated when said ribbed portion is situated in said passage and said tip portion is situated in said bladder; and

passage means, in said retainer plug and said tube, for providing a flow path for a fluid from a fluid source into said space between said balloon and said tube to inflate said balloon.

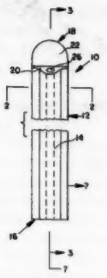
4,555,243

FLEXIBLE AND PROTECTIVE GUIDE DEVICE FOR USE WITH ASPIRATING NEEDLES

Charles W. Markham, 667 Snug Island, Clearwater Bch., Fla. 33515

Filed Mar. 5, 1984, Ser. No. 586,036
Int. Cl.[4] A61B *10/00*
U.S. Cl. 604—263 **7 Claims**

1. An elongated flexible and protective guide device for mounting on an operator's finger and for use with a flexible elongated aspirating needle comprising a flexible elongated tubular element having a proximal and a distal end and an elongated opening therethrough which telescopically receives said needle, a pair of flexible elongated flanges secured to said tubular element, having a length substantially equal to the length of said tubular element and projecting laterally beyond said tubular element to stabilize it against rolling displacement, and said guide device including a flexible distal base portion secured to the remainder of said guide device, said base portion extending distally beyond said tubular element and being made of a flexible plastic having a thickness between about six thousandths of an inch and one hundredth of an inch, providing for tactile palpation therethrough, which thinness allows appreciation of a needle tip presence, while being thick enough to allow for sliding protective engagement with the tip of the aspirating



needle, said base portion being positioned to lie between the projecting needle and the operator's finger, the amount of flexibility of said needle, tubular element, flanges, and base portion being sufficient to allow the operator's finger to bend during said palpation by an amount that allows said operator to feel an abnormal growth or swelling on the area being inspected with said operator's fingertip, said device permitting said operator to continue palpating said growth or enlarged area while simultaneously taking a sample thereof with said aspirating needle, there being no need for the fingertip of the operator to withdraw from the area being sampled, whereby the operator's fingertip can guide the needle into a nodule and can feel the needle entering the nodule while being protected from a puncture wound caused by said needle.

4,555,244

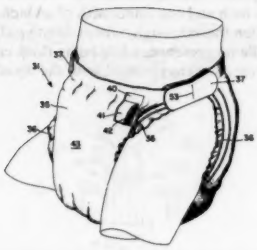
WASTE-CONTAINMENT GARMENT HAVING ABSORBENT BODY AND REUSEABLE SIDE-BRIDGING FASTENER FITMENTS

Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 25, 1983, Ser. No. 517,098
Int. Cl.[4] A41B *13/02*
U.S. Cl. 604—392 **8 Claims**

1. A waste containment garment, said garment comprising an absorbent pad assembly and two discrete side-bridging fastener fitments, said absorbent pad assembly comprising a liquid pervious topsheet, a liquid impervious backsheet, an absorbent core disposed between said topsheet and said backsheet and elasticized leg cuffs, said pad assembly having front and back waistband regions having widths which total less than the midsection girth of an intended wearer of said garment, and said core having end regions having individual widths of from about fifteen to about thirty-five percent of the midsection girth of said wearer; and each of said side-bridging fastener fitments comprising means for detachably securing one end of said fitment to a back corner of said pad assembly and for detachably securing the other end of said fitment to the front corner of said pad assembly on the same side of said pad assembly as said back corner whereby each said fitment will bridge across a side portion of said wearer of said garment said

side-bridging fasteners further comprising means for being substantially inelastic longitudinally, for having sufficient



transverse rigidity to obviate roping, and for having sufficiently compliant longitudinal edge regions to substantially obviate edge marking the skin of said wearer.

4,555,245

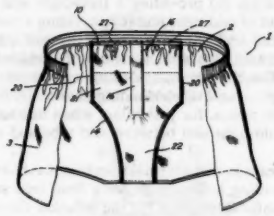
UNDERGARMENT WITH ATTACHED ABSORBENT LINER

Thomas L. Armbruster, Norfolk, Nebr., assignor to Comm Stitch, Norfolk, Nebr.

Filed Aug. 12, 1983, Ser. No. 522,813

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—396 **3 Claims**



1. An undergarment comprising an exterior cloth portion and an interior permanently attached absorbent liner portion; the exterior cloth portion having a waist opening, two leg openings that have a circumference greater than that of a wearer's leg so that the openings fit loosely about the leg, and an openable fly; the absorbent liner portion having a wide area disposed about the openable fly, at least two layers and two contoured elastic borders, one layer being waterproof and the other layer being moisture absorbent and disposed between the waterproof layer and the undergarment wearer, each contoured elastic border forming an edge on the absorbent liner so that the absorbent liner fits snugly against the undergarment wearer's body.

4,555,246

PROCESS FOR PREPARING A HAIR DYE OR HAIR BLEACH COMPOSITION; A COMPOSITION FOR USE IN THIS PROCESS; AND THE USE OF SAID COMPOSITION TO DYE OR BLEACH HAIR

Jean-Francois Grollier, Paris; Christian Monnais, Neuilly-sur-Seine, and Lyonel Peritz, Boulogne-sur-Seine, all of France, assignors to L'Oreal, Paris, France

Filed Apr. 2, 1982, Ser. No. 365,023

Claims priority, application France, Apr. 2, 1981, 81 06676

Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—405 **8 Claims**

1. A process for preparing a clear gel for application to the hair comprising

(a) admixing a gelifiable liquid consisting essentially of a mixture of

(1) a non-ionic compound selected from the group consisting of

(i) polyoxyethylenated fatty alcohol having 8–18 carbon atoms and oxyethylenated with 2–30 moles of ethylene oxide,

(ii) polyglycerolated fatty alcohol having 8–18 carbon atoms and glycerolated with 1–6 moles of glycerol,

(iii) polyoxyethylenated alkylphenol wherein the alkyl moiety has 8–9 carbon atoms and oxyethylenated with 2–30 moles of ethylene oxide, and

(iv) polyglycerolated alkylphenol wherein the alkyl moiety has 8–9 carbon atoms and glycerolated with 4–6 moles of glycerol,

(2) a solvent selected from the group consisting of a lower aliphatic alcohol, a glycol and a glycol ether, and

(3) an oxidation dye present in an amount effective to dye said hair, with

(b) an oxidizing solution comprising a solution of H_2O_2 and an incompatible cationic polymer dissolved therein, said incompatible cationic polymer being one which when mixed with an incompatible polymer test support in an amount from 0.5 to 5 weight percent of said test support results in the formation of a cloud or precipitate, or a separation of said test support into two phases, said test support consisting essentially of 20 g of a nonyl phenol oxyethylenated with 9 moles of ethylene oxide, 24 g of nonyl phenol oxyethylenated with 4 moles of ethylene oxide, 9 g of monobutylether of ethylene glycol, 10 g of propylene glycol, 2.4 g of 40 weight percent aqueous solution of the pentasodium salt of diethylene triamine pentacetic acid, 10 g of ammonia 22° Be'' and water in an amount sufficient for 100 g,

the resulting admixture containing 5 to 60 weight percent of said nonionic compound and 2 to 20 weight percent of said solvent and wherein said incompatible cationic polymer is present in said oxidizing solution in an amount sufficient so that the concentration of said incompatible cationic polymer is between 0.01 and 10 weight percent based on the total weight of the admixture resulting from admixing said gelifiable liquid and said oxidizing solution.

4,555,247

HAIR-DYEING COMPOSITIONS BASED ON NITRO DIRECT DYESTUFFS, AND A DYEING PROCESS USING THESE COMPOSITIONS

Roland de la Mettrie, Asnieres, and Patrick Canivet, Paris, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 291,100, Aug. 7, 1981, abandoned. This application Oct. 26, 1984, Ser. No. 665,083

Claims priority, application France, Aug. 8, 1980, 80 17616; Jun. 16, 1981, 81 11872

Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—405 **17 Claims**

1. A composition having less than twice the number of mutants as the control, as tested by the Ames test, which is suitable for the direct coloration of human hair, said composition comprising at least one violet nitro dyestuff having a shade, on the Munsell scale, from 7.5 P to 10 PB, and at least one yellow nitro dyestuff having a shade, on the Munsell scale from 10 Y to 2.5 Y, these violet and yellow dyestuffs being present in proportions such that their selectivity coefficients are substantially equal, the coefficients being from 3 to 8 when determined at a concentration of 0.1 to 0.6% by weight, the ratio by weight of the violet dyestuff to the yellow dyestuff being from 1:1 to 3:1, so that said violet and yellow dyestuffs complement each other.

4,555,248

PROCESS FOR STABILIZING THE VISCOSITY CHARACTERISTICS OF COAL DERIVED MATERIALS AND THE STABILIZED MATERIALS OBTAINED THEREBY

James C. Bronfenbrenner; Edward P. Foster, and Krishna Tewari, all of Allentown, Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Jun. 20, 1984, Ser. No. 622,371

Int. Cl.[4] C10L *1/18*

U.S. Cl. 44—78 **12 Claims**

1. A process for stabilizing the viscosity during handling and storage at temperatures of 35°–150° C. for a period of time up to about four months of a homogeneous, single phrase blend of solvent refined coal and solvent refined coal liquid distillate which liquid distillate contains indigenous nitrogen base compounds, both derived via liquefaction of a coal feed stock, which process for viscosity stabilization comprises:

(a) adding to said blend of solvent refined coal and solvent refined coal liquid distillate up to about 5.0 percent by weight of a light volatile phenolic viscosity repressor;

(b) passing said blend of solvent refined and solvent refined coal liquid distillate containing said light volatile phenolic viscosity repressor to a storage container while minimizing the loss of light volatile components present therein; and,

(c) maintaining a partial pressure of said phenolic viscosity repressor over said stored blend of solvent refined coal and solvent refined coal liquid distillate throughout storage of said blend to insure that said phenolic viscosity repressor attaches to nitrogen base compounds contained within said blend of solvent refined coal and solvent refined coal liquid distillate to negate a large increase in viscosity.

4,555,249

SOLID FUEL GASIFYING UNIT AND GAS FRACTIONATING UNIT

Arnold M. Leas, 122 N. 34th St., Richmond, Ind. 47374

Filed Dec. 16, 1983, Ser. No. 562,087

Int. Cl.[4] C10J *3/54, 3/56*

U.S. Cl. 48—62 R **12 Claims**

1. An apparatus for gasifying solid combustible fuel comprising:

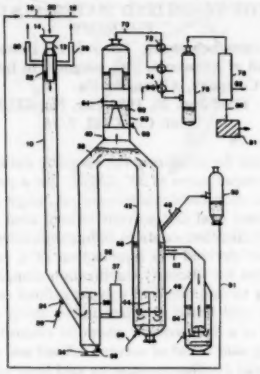
a vertical preheating zone having inlet means near an upper end of the zone and outlet means near a lower end of the zone wherein a solid fuel feed may be transferred through said inlet means in admixture with hot solid reagent to preheat the feed and to form a relatively dense bed of solid feed and reagent particles which extend vertically within the preheating zone to an elevation sufficient to create a gravitational particle flow which forces the solid particles in the lower end of the bed into a vertical gasifying zone;

said vertical gasifying zone having solid fuel inlet means located near a lower end of said gasifying zone and connected to said outlet means of said preheating zone so that said solid fuel and reagent can flow by gravity directly from said preheating zone to said gasifying zone, and having a fluidizing gas inlet means positioned below said solid fuel inlet means so that upon entry of a gasifying medium into the gasifying zone, said solid fuel and reagent in said zone are fluidized and directed to an upper end of the gasifying zone;

a gas-solid separator positioned near the upper end of said

gasifying zone to permit hot reaction gases to exit through the separation means and to direct ash product, reagent, and ungasified solid feed particles to an upper end of a vertical cooling zone;

said vertical cooling zone having a solid particle inlet means through which solids from said gasifying zone may be received to form to a hot downward flowing bed, and having a cooling gas inlet means positioned near a bottom portion of the cooling zone through which relatively cool gases enter and reduce the temperature of said solid particle bed and complete the gasification reaction of the solid fuel; and



a vertical ash separation zone positioned annularly around a lower portion of said cooling zone to receive the solid particles exiting the cooling zone and having a first outlet means directed to an ash recovery zone and a second outlet means located at a lower elevation than said first outlet means and directed to a reagent recycle zone and a fluidizing gas inlet means positioned near the bottom of said separation zone, so that upon entry of a fluidizing gas, said solid particles pass through the annular space around said cooling zone and said lighter ash particles are directed to said ash recovery zone and said heavier reagent particles are directed to said reagent recycle zone.

4,555,250

GRINDING SHEET AND PROCESS FOR PREPARING SAME

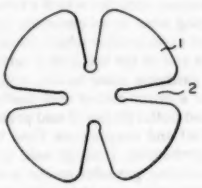
Shin'ichi Horie; Yutaka Matsuzaki, both of Chichibu, and Fumio Kagawa, Kasukabe, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 442,030, Nov. 16, 1982. This application May 29, 1984, Ser. No. 614,844

Claims priority, application Japan, Nov. 16, 1981, 56-182347

Int. Cl.⁴ B24D *3/02*

U.S. Cl. 51—309 **22 Claims**



1. In a process for the preparation of a glass-grinding sheet, which comprises the steps of:

mixing 100 parts by weight of a powdery metal composition comprising copper and at least one metal selected from the group consisting of tin and zinc, with 0.5 to 30 parts by weight of a diamond powder;

sintering the mixture; and then

rolling the obtained sintered body;

wherein said improvement comprises:

providing said powdery metal composition with a content consisting of, based on the weight of the composition:

80 to 96.8% of copper,

3 to 15% of at least one metal selected from the group consisting of tin and zinc, and

0.2 to 5% of at least one metal selected from the group consisting of nickel and titanium, and

at least the copper and said metal selected from tin and zinc in the powdery metal composition constituting an alloy.

4,555,251

PROCESS FOR THE SEPARATION OF GASEOUS MIXTURES USED IN STERILIZATION PROCESSES

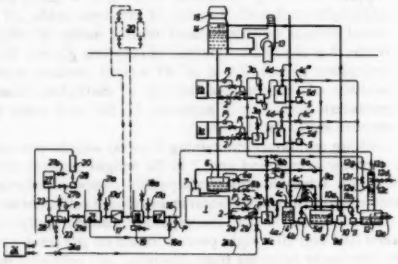
Ernst U. Jonsson, Lund; Sten-Borje Lindqvist, Veberod, and Roland V. Wimmerstedt, Lund, all of Sweden, assignors to Gambro Lundia AB, Sweden

Filed Apr. 30, 1984, Ser. No. 605,585

Claims priority, application Sweden, May 6, 1983, 8302611

Int. Cl.⁴ B01D *53/14*

U.S. Cl. 55—48 **16 Claims**

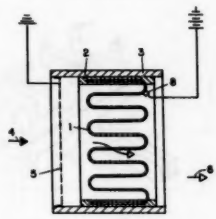


1. A process for the separation of gaseous mixtures used in sterilization processes, such gaseous mixtures including ethylene oxide and at least one chlorofluorocarbon gaseous component, said process comprising the steps of providing an aqueous solvent for said ethylene oxide from a solvent source, mixing said gaseous mixture with said aqueous solvent so as to produce a liquid phase comprising said ethylene oxide at least partially dissolved in said aqueous solvent, said at least one chlorofluorocarbon gaseous component being less soluble in said aqueous solvent than is said ethylene oxide, whereby said at least one chlorofluorocarbon gaseous component remains substantially in the gas phase and is therefore readily separable from said liquid phase, removing said gas phase from said liquid phase, recovering chlorofluorocarbons from said gaseous phase, separating said ethylene oxide from said aqueous solvent in said liquid phase, and recycling said aqueous solvent to said solvent source for subsequent use as said aqueous solvent.

4,555,252
ELECTROSTATIC FILTER CONSTRUCTION

Wolfgang Eckstein, Sereetz, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1984, Ser. No. 594,104
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1983, 3320299
Int. Cl.[4] B03C *3/12, 3/45*
U.S. Cl. 55—132 1 Claim



1. An electrostatic filter for filtering out floating particles comprising:

a housing defining a space and having an inlet opening on one side and an outlet opening on an opposite side with a fluid flow path between said inlet and outlet openings;

a flat screen connected to said frame and covering said inlet opening, said screen acting as a first electrode and being grounded;

a corrugated dielectric filter made of fabric material with filaments which have a metallic vapor deposit thereon of a copper and silver mixture, disposed in said housing between said first electrode and said outlet opening and across said fluid flow path and forming a second electrode, said second electrode having opposite elongated ends;

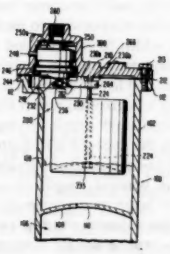
a cement sealing layer connected to said housing on each side thereof opposite said fluid flow path and in said space, said elongated ends of said second electrode being embedded respectively in each of said cement sealing layers for holding said second electrode across said fluid flow path; and

a voltage source connected to said second electrode for applying a voltage thereto.

4,555,253
GAS-LIQUID VORTEX SEPARATOR-ELIMINATOR

Robert Hull, Warwick, R.I., and Joseph A. Lane, Taunton, Mass., assignors to Amtrol, Inc., West Warwick, R.I.

Continuation of Ser. No. 460,056, Jan. 21, 1983, Pat. No. 4,475,932. This application May 3, 1984, Ser. No. 606,634
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—170 17 Claims



1. A gas-liquid vortex separator-eliminator which is adapted to be connected in a closed liquid circulating system having supply and return lines including a circulating pump connected therein for circulating liquid in said circulating system, comprising (a) an upright main body which has an upper chamber (b) and a lower chamber (c), said upper chamber (b) and lower chamber (c) being separated by a horizontal wall (d) that has a gas discharge port (e) in the center thereof, (f) an inlet which has a longitudinal axis which is generally perpendicular to the vertical axis of said upright main body (a), said inlet (f) having a short pipe leg (g) connected to the upper portion of lower chamber (c), (h) an outlet, which has a longitudinal axis which is generally perpendicular to the vertical axis of main body (a) and is generally parallel to the longitudinal axis of inlet (f), said outlet (h) being positioned in the lower portion of said lower chamber (c), and (i) an air eliminator which is located in said upper chamber (b), when said separator-eliminator is in operation, liquid enters said inlet (f) and exits through said outlet (h), the flow of said liquid lower in lower chamber (c) producing a vortex whereby gas in said liquid is released in the form of bubbles, said liquid-exit outlet (h) being blow where said bubbles form and/or where gas bubbles entrained in said liquid are carried by said vortex, said gas bubbles rising into said upper chamber (b) and being purged into the atmosphere by means of said air eliminator (i), said gas vent-eliminator (i) for automatically venting entrapped gas from a liquid system having a pilot valve-operated diaphragm valve means comprising a valve seat structure containing an upwardly facing rigid valve seat member having a central aperture communicating with the interior of said upper chamber (b), a pilot valve-operated flexible diaphragm valve member having a sealing surface which faces downward and sealing engages against said rigid valve seat member, said diaphragm valve member having a central aperture, a chamber located above said flexible diaphragm member, on the side of said flexible diaphragm member opposite said sealing surface, said chamber communicating with said central aperture of said diaphragm valve member, a retaining means to position and retain said flexible diaphragm member in said valve seat structure such that said sealing surface on said flexible diaphragm member is in contact with said rigid valve member, said retaining means having a central aperture which is aligned with and communicates with said central aperture of said diaphragm valve member, and a pilot valve pin slidably located in said central aperture of said diaphragm valve member, at least one passageway being located in the lower portion of said pilot valve pin, said lower passageway being located in the lower portion of said pilot valve pin, said lower passageway allowing communication between said cavity in said upper chamber (b) and said central aperture in said diaphragm valve member when said diaphragm valve member sealingly engages said valve seat member and not being in such communication position once said lower passageway has moved entirely within said central aperture of said diaphragm valve member or when such sealing engagement does not exist, said pilot valve pin allowing communication between said chamber and said air outlet when said sealing engagement does not exist, at least one passageway or indentation being located in the upper portion of said pilot valve pin, said upper passageway or indentation allowing communication between said chamber and said air outlet once said diaphragm valve member is not in the sealing position, said pilot valve-operated diaphragm valve means selectively opening and closing said air outlet, the air pressure within said upper chamber (b) being used to open and close said diaphragm valve means, and float means within said upper chamber (b) operatively connected to said pilot valve pin, said float means rising and falling as the water level in said upper chamber (b) rises and falls such that when said float means reaches a first predetermined lower position said pilot valve pin no longer allows communication between said chamber and said upper chamber (b), when said float means reaches a second predetermined lower position said pilot valve pin causes said diaphragm valve to open and vent air through said air outlet, via from a said central aperture of said rigid valve seat member to said air outlet, said upper passageway or indentation in the upper portion of said pilot valve pin being in a position which allows communication between said chamber and said air outlet, said upper passageway or indentation in the

upper portion of said pilot valve pin being in a position which allows communication between said chamber and said air outlet, and when said float means reaches a predetermined upper position said pilot valve pin causes said diaphragm valve to close by allowing passage of air from said housing to said chamber located above said diaphragm said valve means, which returns to said sealing position, said diaphragm valve member being in sealing engagement with said rigid seat member whenever said float means is in its up sealing position or the air pressure in said chamber is equal to or greater than the air pressure in said cavity.

4,555,254

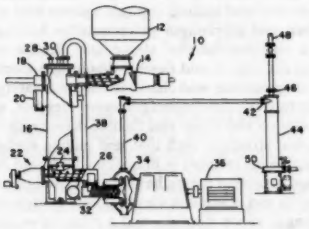
MATERIAL COLLECTOR AND DISCHARGER APPARATUS

Chester D. Fisher, Muncy, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 30, 1982, Ser. No. 445,495

Int. Cl.⁴ B01D *45/14;* **D21C** *1/02;* **D21B** *1/16*

U.S. Cl. 55—345 **4 Claims**



1. A material collector and discharger apparatus for use in a system in which solid material is processed in a gaseous fluid environment maintained at an elevated pressure and an admixture of said solid material and said gaseous fluid at elevated pressure is conveyed from a cyclone separator to said collector and discharger apparatus, said apparatus comprising:

a housing having a cylindrical side wall closed at one end and open at the other end and constructed and arranged to receive said solid material and said gaseous fluid and to collect said solid material about the cylindrical side wall thereof,

replaceable orifice means in said cylindrical side wall of said housing to discharge the collected solid materials, said orifice means having a selected sized orifice opening for controlled pressure discharge of the collected solid material with a predetermined minor portion of said pressurized gaseous fluid,

rotary blade impeller means within said housing to centrifugally urge said solid material toward said housing cylindrical side wall, said impeller means having a blade width at its free end that is slightly narrower than the width of said cylindrical side wall and a blade reach closely approximating the inner diameter of said cylindrical side wall, the axis of said rotary blade impeller means being perpendicular to the axis of said replaceable orifice means,

drive means for said impeller means, and

said cyclone operatively connected to said housing to provide for the conveyance of said admixture of said solid material and said gaseous fluid at elevated pressure to said housing and to maintain the pressure of said gaseous fluid in said housing at an elevated pressure.

4,555,255

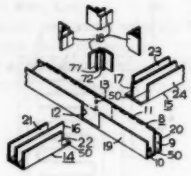
CORNER CONNECTOR CLIP IN AN AIR FILTER GRID

Gary T. Kissel, Louisville, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 613,143, May 23, 1984, abandoned. This application Apr. 23, 1985, Ser. No. 726,914

Int. Cl.⁴ B01D *46/54*

U.S. Cl. 55—355 **6 Claims**



1. An invertible corner connecting clip for use in completing either a right-hand or a left-hand corner when assembling a suspended ceiling latticework of the type including main and cross filter supported members each having spaced apart side walls extending vertically from a bottom wall, said side walls of said main member having notches spaced along its length, to permit free ends of said cross support members to set therein with said bottom wall of each cross support member overlying the bottom wall of said main support member to place said spaced side walls of each cross support member in left and right-hand corner forming relationship with said main support member side walls, said invertible corner connecting clip comprising:

an out-corner unit including

a first out-corner plate having first horizontally extending upper and lower edges, and a first vertical common edge,

a second out-corner corner plate having second horizontally extending upper and lower edges and a second vertical common edge,

said first and second out-corner plates joined together along said common edges to form said out-corner unit;

an in-corner unit including

a first in-corner plate having first horizontally extending top and bottom edges and a first common vertical margin,

a second in-corner plate having second horizontally extending top and bottom edges and a second common vertical margin;

said first and second in-corner plates joined together along said common margins to form said in-corner unit;

means connecting said out-corner unit and in-corner units in spaced parallel relationship to each other to form pockets of uniform width to receive said side walls of said main and cross support members therebetween;

said first upper and lower edges of said first out-corner plate each having a horizontal notch therein adjacent said first common edge, said notch having a vertical dimension equal to the thickness of said bottom wall; and

said second out-corner plate having a vertical dimension equal to the vertical length of said first common edge between said horizontal notches to define upper and lower relieved areas adjacent the top and bottom edges of said second out-corner plate for accommodating the thickness of said bottom wall when assembled in a latticework to permit inversion of said clip for use in completing either a right or a left-hand corner connection between main and cross member side walls.

4,555,256
PROCESS AND DEVICE FOR THE PRODUCTION OF GASEOUS OXYGEN AT ELEVATED PRESSURE

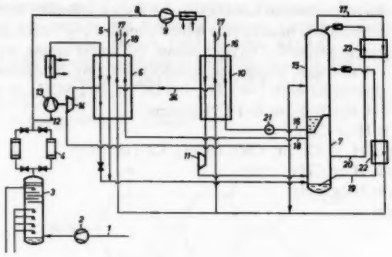
Werner Skolaude, Munich, and Gunnar Eggendorfer, Grunwald, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskruth, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,359

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216510; May 3, 1982, 3216502

Int. Cl.⁴ F25J *3/04*

U.S. Cl. 62—18 **24 Claims**



1. Process for the production of gaseous O at an elevated pressure by low temperature rectification of air, comprising reducing energy requirements for production of oxygen by compressing, purifying and at least in part cooling the air in a first heat exchange in heat exchange with rectification product, passing the air to the rectification, compressing a second gas stream to a higher pressure, cooling the second gas stream, after compressing, in a second heat exchanger in heat exchange with rectification product, withdrawing heat at an intermediate point along the second heat exchanger, whereby temperature differences at a cold end of the second heat exchanger are reduced, adding the withdrawn heat to the first heat exchanger, whereby less air is required for heating at a cold end of the first heat exchanger, expanding the second gas stream, after cooling, and passing the second gas stream, after expanding to the rectification, and cooling a third gas stream to be fractionated in heat exchange with fractionation product, liquid oxygen being withdrawn from the rectification, and being pumped to the desired pressure, and, in heat exchange with the compressed gas stream, being evaporated and heated, whereby energy requirements for the production of oxygen is reduced.

4,555,257
OPTICAL FIBRE PULLING TOWER

Kenneth G. Howard, Dartford, and Ian E. Little, Chislehurst, both of England, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Aug. 31, 1984, Ser. No. 646,088

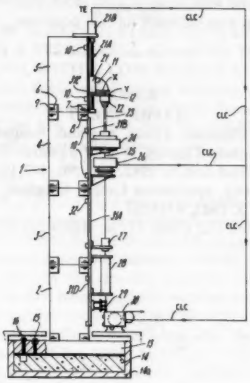
Claims priority, application United Kingdom, Sep. 3, 1983, 8323692

Int. Cl.⁴ C03B *37/025*

U.S. Cl. 65—13 **7 Claims**

1. An optical fibre pulling tower comprising:

an elongate structure made of case synthetic granite expoxy conrete with metal mounting plates case in situ; and



a preform holding chuck, a furnace and a coating application stage each secured to the structure by means of the metal mounting plates.

4,555,258
PRESSING MACHINE FOR THE MANUFACTURE OF GLASS ARTICLES

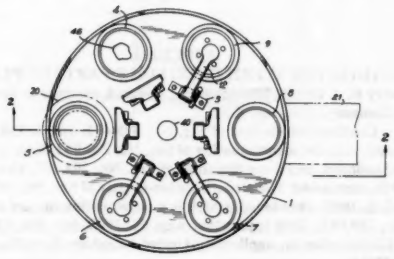
Jesus V. Curiel, Monterrey, Mexico, assignor to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed May 9, 1984, Ser. No. 608,478

Claims priority, application Mexico, May 13, 1983, 197273

Int. Cl.⁴ C03B *11/02*

U.S. Cl. 65—319 **15 Claims**



1. An improved pressing machine for the manufacture of glass articles, of the type which includes a gyratory table composed of mold supporters equidistantly laid out around the circularity of the table and at an intermediate position in respect of its radius, thereby carrying the molds from one station to the next as the table gyrates intermittently; featured by a machine encompassing six stations associated with the table, namely: one glass-gob charging station, one pressing station, two stations for the continuous cooling of articles, one extracting station and one station for the continuous cooling of molds; a system for the continuous external cooling of supporters and molds formed by a source of cooling fluid, a plurality of ducts on the table, each one corresponding to each respective mold supporter and mold, for sweeping the external surfaces of the supporters and molds; and a system for the continuous internal cooling of articles, including, for each mold supporter, a cooling device composed of ducts for causing a cooling fluid to circulate in order to cool the articles, which embraces a cool-

ing member, a laying arm which displaces said cooling member between a mold cooling position and a raised inactive position, such arm being coupled to the gyratory table so as to travel along with it and with its associated mold, and a mechanism for displacing said arm between its two positions.

4,555,259

COMPONENT

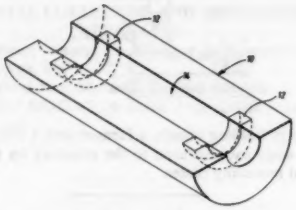
Terence J. Williamson, Leeds, England, assignor to Burwell, Reed & Kinghorn Limited, West Yorkshire, England

Filed Dec. 6, 1982, Ser. No. 447,162

Claims priority, application United Kingdom, Dec. 7, 1981, 8136808; Jun. 3, 1982, 8216153

Int. Cl.⁴ C03B *11/06;* B22D *11/126*

U.S. Cl. 65—374.12 **5 Claims**



1. A glass mold component which comprises a casting of a first metal having an insert therein to provide reinforcement, the insert being of a second, reinforcing metal whose melting point is below the casting temperature of the first metal, and the component having a machined surface of the desired final shape along both the cast first metal and the insert of the second metal which is exposed to provide reinforcement in molding of glass.

4,555,260

METHOD FOR STERILIZING MALE PARTS OF PLANTS

Barry R. J. Devlin, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 395,401, Jul. 6, 1982, abandoned, and a continuation of Ser. No. 289,552, Aug. 3, 1981, abandoned, and a continuation of Ser. No. 201,107, Oct. 28, 1980, abandoned, and a continuation-in-part of Ser. No. 395,525, Jul. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 289,552,. This application Aug. 15, 1983, Ser. No. 523,227

Claims priority, application United Kingdom, Nov. 16, 1979, 7939781

Int. Cl.⁴ A01N *43/00*

U.S. Cl. 71—88 **9 Claims**

1. A method for producing male sterility in a cereal grain plant without substantial effect on the female fertility of the plant, which comprises applying to the plant an effective dosage of 3-carboxyazetidine, a hydrate or salt thereof.

4,555,261

HERBICIDAL SULFONAMIDES

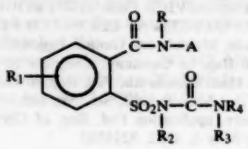
Wallace C. Petersen, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 395,781, Jul. 12, 1982, Pat. No. 4,491,467, which is a continuation-in-part of Ser. No. 295,247, Aug. 24, 1981, abandoned. This application Nov. 1, 1984, Ser. No. 667,470

Int. Cl.⁴ C07D *401/12, 405/12;* A01N *43/70, 43/66*

U.S. Cl. 71—90 **17 Claims**

1. A compound selected from



wherein

A is a six-membered aromatic heterocycle, a six-membered dihydroaromatic heterocycle or a six-membered tetrahydroaromatic heterocycle which contains 1–4 hetero-atoms selected from 0–1 oxygen atoms, 0–1 sulfur atoms, and/or 0–4 nitrogen atoms; the heterocycles may be optionally substituted with 1–4 CH_3, 1–3 OCH_3, 0–1 SCH_3, 0–1 Cl, 0–1 $N(CH_3)_2$, or 0–1 CN groups;

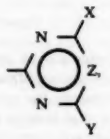
R is H or CH_3;

R_1 is H, F, Cl, Br, CH_3, OCH_3, CF_3 or NO_2;

R_2 is H or CH_3;

R_3 is H or CH_3;

R_4 is



X is CH_3, OCH_3 or Cl;

Y is H, CH_3, C_2H_5, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$ or $N(CH_3)_2$; and

Z is N; provided that

(1) the bond between N—R and A is attached to to a nitrogen or carbon atom of A.

4,555,262

N-AZIDOPHENYLSULFONYL-N'-PYRIMIDINYL UREAS

Rudolph C. Thummel, Courgenay, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

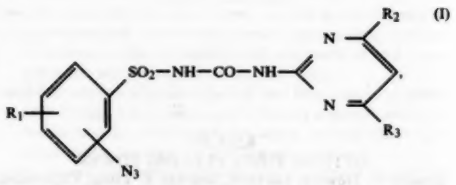
Filed Aug. 22, 1983, Ser. No. 525,365

Claims priority, application Switzerland, Sep. 1, 1982, 5196/82

Int. Cl.⁴ A01N *47/36;* C07D *239/46, 251/16*

U.S. Cl. 71—92 **20 Claims**

1. An N-azidophenylsulfonyl-N'-pyrimidinyl urea of the formula I



(I)

wherein

R_1 is hydrogen, halogen, nitro, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4alkoxycarbonyl, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl, C_1–C_4alkylsulfonyl or C_2–C_5alkoxyalkoxy,

R_2 is C_1–C_3alkyl, C_1–C_3alkoxy or C_1–C_3haloalkoxy,

R_3 is hydrogen, halogen, C_1–C_3alkyl, C_1–C_3haloalkyl,

C_1–C_3alkoxy, C_1–C_3haloalkoxy, C_2–C_5alkoxyalkoxy or —NR_4R_5, wherein

R_4 is hydrogen or methyl and

R_5 is hydrogen, methyl, ethyl or methoxy,

or a salt thereof.

4,555,263

HERBICIDAL CYCLOHEXANE-1,3-DIONE DERIVATIVES

Alexander Serban, Doncaster; Keith G. Watson, Box Hill North; Graham J. Bird, North Melbourne; Graeme J. Farquharson, Reservoir, and Timothy L. Houston, Burwood, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

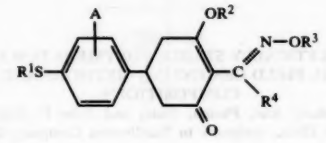
Filed Dec. 6, 1982, Ser. No. 447,137

Claims priority, application Australia, Dec. 23, 1981, PF2072

Int. Cl.[4] A01N *33/24*; C07C *131/00*

U.S. Cl. 71—98 **8 Claims**

1. A compound of formula



wherein:

R^1 is selected from C_1 to C_6 alkyl;

A is selected from hydrogen and nitro;

R^2 is selected from the group consisting of hydrogen and the cations of the alkali metal ions;

R^3 is selected from ethyl and allyl; and

R^4 is selected from ethyl and n-propyl.

6. A process for severely damaging or killing unwanted plants which process comprises applying to said plants, or to the growth medium of said plants, an effective amount of a compound as defined according to claim 1.

4,555,264

PROCESS FOR PRODUCING STEEL FOR AN ELECTRICAL STEEL SHEET

Takeaki Takeshita; Katuyuki Oba; Yoshiaki Shimoyama, and Takashi Masuda, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 25, 1982, Ser. No. 411,552

Int. Cl.[4] C21C *7/06*

U.S. Cl. 75—49 **4 Claims**

1. A process for producing steel having 0.0030% or less of C, for an electrical steel sheet, comprising the steps of:

(1) tapping molten steel from a steelmaking furnace, and transferring it to a vacuum-degassing apparatus equipped with a means for blowing a gas into the molten steel;

(2) subjecting the molten steel to a degassing treatment including reducing the ultimate degree of vacuum in said degassing apparatus to 1.0 mmHg or less while blowing an inert gas into the molten steel at a rate of from 30 to 150 Nl/min per gas-blowing orifice so as to reduce the carbon content of the molten steel to 0.0030% or less;

(3) adding silicon, a silicon-containing alloy or an alloying component to the decarburized molten steel in an amount such that the silicon content in the molten steel is in a range of from 1.0% to 3.5% and thereby preparing molten steel for a non-oriented silicon steel sheet;

(4) in order to subject the resultant molten steel to continuous casting, bringing said molten metal into contact with a melt-receiving vessel, a melt-supplying apparatus, and a heat-insulating agent for the melt; and

(5) applying a casting powder onto the surface of the molten steel in a continuous casting mold, "the carbon content of each of said melt-receiving vessel, melt-supplying apparatus, heat-insulating agent, and casting powder being 3.0% or less."

4,555,265

METHOD OF TREATING STEEL WITH CALCIUM, TO OBTAIN A STEEL WELL ADAPTED TO COLD FORMING, WITH A LOW SILICON CONTENT

André Gueussier, Paris, and Edmond Vachiery, Solesmes, both of France, assignors to Vallourec, Paris, France

Filed Sep. 10, 1984, Ser. No. 648,821

Claims priority, application France, Sep. 20, 1983, 83 15191

Int. Cl.[4] C21C *7/02*

U.S. Cl. 75—53 **11 Claims**

1. A method of producing a steel well-adapted to cold forming, comprising preparing a deoxidated liquid steel having a silicon content of less than 5 thousandths of a % by weight, then adding a cored wire containing a divided material to the liquid steel, wherein the divided material has at least two constituents, the first being granular metallic calcium, in which the content of particles smaller than 150 mesh is not more than 2 to 3% by weight of said constituent, and the second being silico-calcium containing (as % by weight): Ca 25 to 35; Si 50 to 70; Fe and impurities 5 to 15, ratio K of the content of the first constituent to that of the second being from 0.1 to 3 and preferably 0.3 to 2.

4,555,266

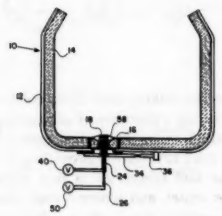
METHOD AND APPARATUS FOR TREATING LIQUID METAL IN A VESSEL

William Wells, Charlotte, N.C., assignor to Korf Technologies, Inc., Charlotte, N.C.

Division of Ser. No. 308,701, Oct. 5, 1981, Pat. No. 4,424,955. This application Aug. 29, 1983, Ser. No. 527,715

Int. Cl.[4] C21B *13/00*

U.S. Cl. 75—53 **3 Claims**



1. A method of preparing a bottom-pour vessel for subsurface gas treatment through a nozzle well in its bottom wall, said vessel having a refractory lining, said method comprising

(1) inserting a dense refractory nozzle block into the nozzle well within the lining of the vessel and mortaring it into place while the vessel is at ambient temperature;

(2) heating the ladle to operating temperature;

(3) inserting a tuyere block into the opening in said nozzle block from the bottom of said vessel and mortaring said tuyere block into position, said tuyere block comprising a refractory brick adapted to fit into the opening in said nozzle block and having a central vertical hole therethrough, an outer pipe fixed in the vertical hole in said tuyere block, its upper end terminating at the upper end of said block and its lower end extending beyond the lower end of said block, and an inner pipe within said outer pipe, its upper end coextensive with said outer pipe and its lower end extending beyond the lower end of said block, said inner pipe carrying projections on its outer surface to form an annular conduit between said inner and outer pipe;

(4) fixing a nozzle closure apparatus to the exterior of said vessel in the nozzle-open position with said pipes extend-

ing from the nozzle block downwardly through the nozzle opening; and

(5) connecting said inner pipe to a first source of gas and connecting the annular conduit to a second gas source.

4,555,267

PROCESS FOR MAKING FUEL FROM SOLID METALLIC IRON-BEARING MATERIALS

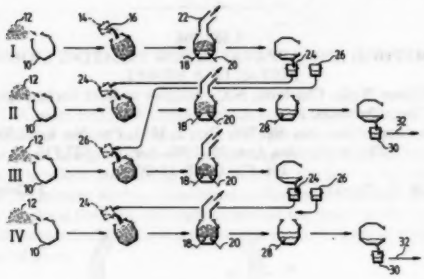
Manfred Chitil, Krefeld-Bockum, Fed. Rep. of Germany, assignor to Klöckner CRA Technologie GmbH, Duisburg, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 498,045

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 3226590

Int. Cl.⁴ C21C *7/00*

U.S. Cl. 75—46 **7 Claims**



1. A process for making steel from solid metallic iron-bearing materials during a plurality of alternating converter cycles including production cycles and repeat cycles using a converter having inlet tuyeres for providing a carbonaceous fuel and oxygen to said converter, a first storage vessel, and a second storage vessel, and wherein said process comprises:

preparing a molten metal charge during one of said converter cycles;

filling a quantity of said materials into said converter during each of said converter cycles;

pouring a portion of said metal charge over said materials filled in said converter to form a total charge during each of said converter cycles;

introducing said fuel and said oxygen into said converter for melting said total charge during each of said converter cycles;

melting said total charge in said converter to form a total tap during each of said converter cycles;

tapping a first portion of said total tap into said first storage vessel during each of said repeat cycles for use as a first metal charge in a first subsequent converter cycle;

tapping a second portion of said total tap into said second storage vessel during each of said repeat cycles for use as a second metal charge in a second subsequent converter cycle and wherein said first portion of said total tap and said second portion of said total tap together comprise a major portion of said total tap; and

alternating said converter cycles such that a tap from at least one of said converter cycles is delivered to a subsequent processing operation.

4,555,268

METHOD FOR IMPROVING HANDLING PROPERTIES OF A FLAKED TANTALUM POWDER COMPOSITION

Marlyn F. Getz, Barto, Pa., assignor to Cabot Corporation, Boston, Mass.

Filed Dec. 18, 1984, Ser. No. 683,243

Int. Cl.⁴ C22C *1/09*

U.S. Cl. 75—229 **12 Claims**

1. A method of preparing a tantalum powder composition comprising:

heat treating a flaked tantalum powder at a temperature ranging from about 1250° C. to about 1550° C. for a period ranging from about 5 to about 120 minutes in order to pre-agglomerate the flaked powder;

mixing the pre-agglomerated flaked tantalum powder with a granular tantalum powder to form a tantalum powder composition;

agglomerating said tantalum powder composition at a temperature of about 1250° C. to about 1550° C. for a period of from about 5 to about 120 minutes.

4,555,269

HYDROLYTICALLY STABLE POLYMERS FOR USE IN OIL FIELD CEMENTING METHODS AND COMPOSITIONS

S. Prabhakara Rao, Parma, Ohio, and John F. Burkhalter, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 592,989, Mar. 23, 1984, Pat. No. 4,515,635. This application Feb. 20, 1985, Ser. No. 703,377

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.⁴ C04B *7/35*

U.S. Cl. 106—90 **19 Claims**

1. A cementing composition for use in oil, gas and water well cementing operations comprising water, hydraulic cement, and a copolymer or copolymer salt of N,N,dimethylacrylamide and 2-acrylamido, 2-methyl propane sulfonic acid or acid salts thereof wherein said copolymer has a N,N,dimethylacrylamide to 2-acrylamido, 2-methyl propane sulfonic acid ratio from about 1:4 to about 4:1 and a molecular weight such that a 1000 ppm aqueous solution of said copolymer has a Brookfield viscosity reading at 5 rpm of the U.L. Adapter Spindle in the range of between about 30 and about 250 centipoise.

4,555,270

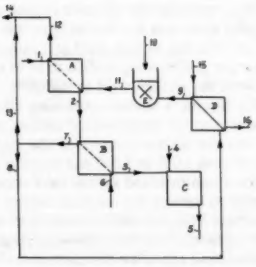
BEET JUICE EXTRACTING PROCESS

Jacques Ponant, Paris, France, assignor to Union Nationale des Cooperatives Agricoles de Transformation de la Betterave, Paris, France

Filed May 1, 1984, Ser. No. 605,803

Int. Cl.⁴ C12B *1/00*

U.S. Cl. 127—44 **4 Claims**



1. In a beet juice extracting process comprising first treating beets cut into cossettes with calcium ions and then extracting

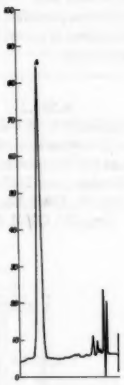
beet juice, the improvement wherein said first treatment is effected by treatment of the cossettes with an aqueous solution of calcium saccharate at a temperature lower than 15° C.

4,555,271

PROCESS FOR PURIFYING LACTULOSE SYRUP

Renato Carobbi, Pistoia; Sandro Miletti, Florence, and Vittorio Franci, San Pietro a Sieve, all of Italy, assignors to Sirac SpA, Milan, Italy

Filed Jun. 18, 1984, Ser. No. 621,542
Claims priority, application Italy, Jun. 20, 1983, 21689 A/83
Int. Cl.[4] C13D *3/14*
U.S. Cl. 127—46.2 **3 Claims**



1. A process for purifying commercial lactulose syrup, to obtain a syrup with a content of 50% by weight of lactulose, and to reduce the content of lactose, galactose and other carbohydrates to a level not exceeding, respectively, 0.2%, 0.1% and 2% by weight, comprising: oxidizing said commercial lactulose either chemically with bromine or in an electrochemical cell in the presence of sodium bromide to obtain an aqueous solution; successively passing the aqueous solution obtained over the following ion-exchange resins:
(a) strong cationic resin in H^+ form
(b) weak anionic resin in OH^- form
(c) strong anionic resin in bisulphite form
(d) strong cationic resin in H^+ form
(e) weak anionic resin in OH^- form,
the passage (c) being effected at a temperature of between 0° and 10° C.; and then concentrating the solution under vacuum to a concentration of lactulose of 50% by weight.

4,555,272

BETA COPPER BASE ALLOY ADAPTED TO BE FORMED AS A SEMI-SOLID METAL SLURRY AND A PROCESS FOR MAKING SAME

Sankaranarayanan Ashok, Bethany, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 11, 1984, Ser. No. 598,960
Int. Cl.[4] C22F *1/08*
U.S. Cl. 148—3 **4 Claims**

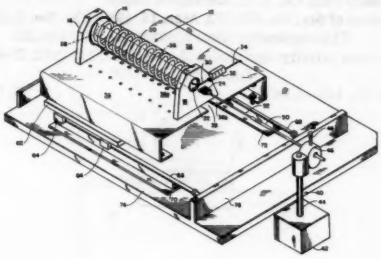
1. A process for making a copper base alloy adapted to be formed in a semi-solid slurry condition comprising:
providing an alloy consisting essentially of from about 9% to about 10.5% by weight aluminum, at least about 10% by weight nickel and the balance essentially copper; or
an alloy consisting essentially of from about 9% to about 10.5% by weight aluminum, from about 3% to about 7% by weight nickel, from about 3% to about 7% by weight iron with the total nickel and iron contents being at least about 10%, balance essentially copper; and
chill casting without stirring said alloy from a fully molten condition with a cooling rate throughout the section of the casting comprising at least about 10° C./sec.

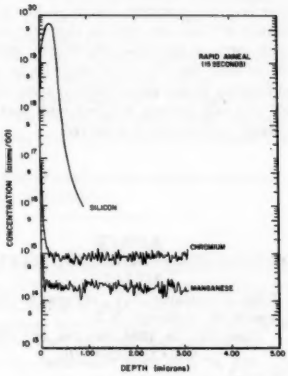
4,555,273

FURNACE TRANSIENT ANNEAL PROCESS

David A. Collins; Derek L. Lile, and Carl R. Zeisse, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1984, Ser. No. 583,560
Int. Cl.[4] H01L *21/324, 21/265*
U.S. Cl. 148—1.5 **12 Claims**





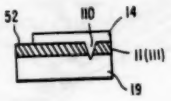
1. A method of rapidly raising the temperature of a semiconductor sample comprising the steps of:
(a) providing a furnace having a single aperture through which said semiconductor sample can be placed within the interior of said furnace, said furnace being otherwise closed and having no other apertures through which heat can escape;
(b) affixing said furnace to a moveable assembly such that said furnace can be moved along a designated path;
(c) placing said semiconductor sample upon a stationary semiconductor sample support assembly that is adjacent said furnace and aligned to be within said designated path such that said furnace can be advanced along said designated path so as to enclose said semiconductor sample and such that said furnace can also be withdrawn along said designated path;
(d) preheating said furnace to a desired temperature;
(e) advancing said furnace along said designated path such that said semiconductor sample enters said preheated furnace through said aperture;

(f) retaining said semiconductor sample within said furnace for a period of time on the order of 10 to 30 seconds;
(g) withdrawing said furnace back along said designated path to remove said semiconductor sample from said furnace.

4,555,274
ION SELECTIVE ELECTRODE AND PROCESS OF PREPARING THE SAME

Masao Kitajima; Osamu Seshimoto, both of Saitama, and Shigemitsu Mizutani, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 475,672, Mar. 15, 1983, Pat. No. 4,528,085. This application Jun. 7, 1984, Ser. No. 618,285
Claims priority, application Japan, Mar. 15, 1982, 57-40398
Int. Cl.[4] C25F *5/00*
U.S. Cl. 148—6.14 R **22 Claims**

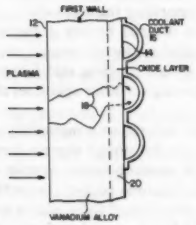


1. In a process for preparing an ion selective electrode which comprises laminating, in sequence, a conductive layer and an ion selective layer on a support, the improvement which comprises forming at least one groove through said conductive layer, which forms at least two electrically separate conductive layers, at least one of which provides an electromotive force, and forming an ion selective layer over said conductive layer such that said groove is filled with said ion selective layer, whereby antishorting is achieved.

4,555,275
HYDROGEN PERMEATION PROTECTION FOR METALS

Albert G. Tobin, Hauppauge, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 19, 1984, Ser. No. 662,736
Int. Cl.[4] C23F *7/02*
U.S. Cl. 148—6.3 **7 Claims**



1. A method for reducing hydrogen permeation of a vanadium metal member, the method comprising the steps:
diffusing a metal into one surface of the member to form a diffusion gradient with respect to the surface, the metal selected from the group including Cr, Al, Si or NiCr; and oxidizing the diffused metal.

4,555,276
HIGH DENSITY PRESSURE RESISTANT INVERT BLASTING EMULSIONS

Scott Winston, Budd Lake, N.J., assignor to Hercules Incorporated, Wilmington, Del.

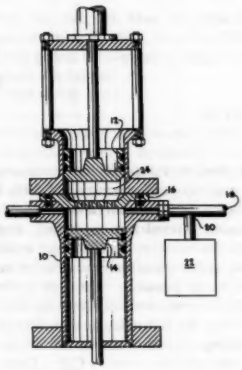
Filed Oct. 29, 1984, Ser. No. 666,070
Int. Cl.[4] C06B *45/32*
U.S. Cl. 149—6 **17 Claims**

1. A high density emulsion blasting composition of
(A) a water-in-oil emulsion component comprising a continuous hydrophobic organic phase, a discontinuous aqueous phase containing at least one soluble inorganic oxidizer salt, and an emulsifier; and
(B) an effective amount of a sensitizing formulation comprising
(1) particulate aluminum and
(2) particulate smokeless powder, in which the ratio of (1) to (2) in said formulation is about 0.5–10 to 1–40 percent by weight of composition.

4,555,277
EXTRUSION CAST EXPLOSIVE

Kenneth J. Scribner, Livermore, Calif., assignor to The United States of America as represented by the Unites States Department of Energy, Washington, D.C.

Filed Jan. 29, 1985, Ser. No. 696,276
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.4 **18 Claims**



1. A multiphase extrusion cast explosive composition comprising:
a crystalline explosive material;
an energetic liquid plasticizer;
a urethane prepolymer mixture, comprising a blend of polyvinyl formal and polycaprolactone;
a polyfunctional isocyanate; and
a catalyst.

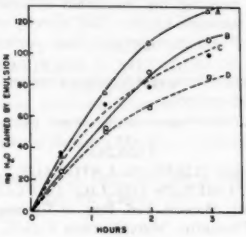
4,555,278
STABLE NITRATE/EMULSION EXPLOSIVES AND EMULSION FOR USE THEREIN

Lawrence A. Cescon, Hagerstown, Md., and Nolan J. Millet, Jr., Hopatcong, N.J., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 576,602, Feb. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 493,916, May 12, 1983, abandoned. This application Jan. 29, 1985, Ser. No. 696,200
Int. Cl.[4] C06B *45/02*
U.S. Cl. 149—21 **56 Claims**

1. In a method of preparing an explosive composition by combining inorganic nitrate particles with a water-in-oil emul-

sion comprising (a) a liquid carbonaceous fuel having components which form a continuous emulsion phase, (b) an aqueous solution of an inorganic oxidizing salt forming a discontinuous emulsion phase dispersed at discrete droplets within said continuous phase, and (c) an emulsifying agent to form a blend of



said particles and said emulsion containing a sensitizing amount of dispersed gas bubbles or voids, the improvement comprising forming said inorganic nitrate particles and the components of said emulsion into a structure that minimizes the loss of water from said droplets and transportation thereof across said continuous oil phase to said nitrate particles.

4,555,279

LOW DETONATION VELOCITY EXPLOSIVE COMPOSITION

Richard L. Funk, Hackettstown, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 597,311, Apr. 5, 1984, Pat. No. 4,490,196. This application Oct. 16, 1984, Ser. No. 661,493
The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.
Int. Cl.[4] C06B *25/34*
U.S. Cl. 149—92 **30 Claims**

1. An explosive composition comprising

(a) at least one component selected from the group consisting of

$$ROOC—A—COOR^1,$$

$$[R''—A—O]_3[PO_4],$$

$$R''—A—[NO_2]_2,$$

and

$$R'''—Ac)_m$$

in which

R and R^1 are individually defined as a lower alkyl group;

A is defined as the nucleus of a substituted or unsubstituted aromatic group;

R'' is an alkyl group of 1–2 carbon atoms;

R''' is an alkyl group of 3–8 carbon atoms;

Ac is an acetoxy group; and

m is a whole number of 1–3;

(b) a component comprising at least one member selected from the group consisting of metriol trinitrate, diethylene glycol dinitrate, and nitroglycerin; and

(c) an stabilizing amount of at least one organic stabilizer component;

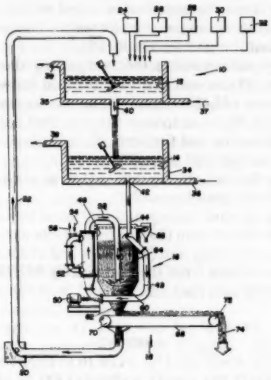
the ratio by weight of (a) to (b) components in said composition being about 9–45 to 91–55.

4,555,280

PROCESS FOR SIMULTANEOUSLY CRYSTALLIZING COMPONENTS OF EAK EXPLOSIVE

Michael L. Levinthal, Brigham City, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Sep. 10, 1984, Ser. No. 648,430
Int. Cl.[4] D03D *23/00*
U.S. Cl. 149—109.6 **12 Claims**



1. A process for forming an explosive composition comprising ammonium nitrate, ethylene diamine dinitrate, and potassium nitrate, comprising the steps of:

A. forming an aqueous solution of ammonium nitrate, ethylene diamine dinitrate, and potassium nitrate;

B. cooling said solution sufficiently to concurrently crystallize said ammonium nitrate, ethylene diamine dinitrate, and potassium nitrate, thereby forming a crystallized composition; and

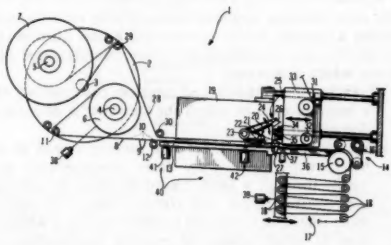
C. separating said crystallized composition from the remainder of said aqueous solution.

4,555,281

METHOD FOR AUTOMATICALLY SETTING AND JOINING REEL-FED LABEL STRIPS OR SIMILAR

Riccardo Mattei, Bologna, and Roberto Osti, Zola Predosa, both of Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Oct. 15, 1984, Ser. No. 661,247
Claims priority, application Italy, Oct. 28, 1983, 3598 A/83
Int. Cl.[4] B65H *69/06*
U.S. Cl. 156—64 **4 Claims**



1. A method for automatically setting and joining reel-fed label strips or similar, each said label being joined to adjacent labels along separating lines (**10**) each including a slit (**47**), the method comprising:

feeding a first label strip (**8**) off a first reel (**6**) to a user

machine through a joining unit (25), a cutting unit (34) and a strip (8) feed unit (14), all located between the said first reel (6) and the said user machine;

arranging a second label strip (28) off a second reel (7) in an idle position in which the said second strip (28) over laps the said first strip (8) and extends through the said joining unit (25) and the said cutting unit (34);

feeding the said first strip (8), in response to a signal indicating imminent runout of the said first reel (6), at a speed greater than the assimilation speed of the said user machine, in such a manner as to create a reserve between the latter and the said feed unit (14);

activating parting means (46) for parting the edges of one said slit (47) on said first strip (8), and for activating control means (45,48,49) controlling the location of the said first strip (8), so as to stop the said feed unit (14) when a label (9) on the said first strip (8) coincides with a label (9) on the said second strip (28);

activating the said cutting unit (34) so as to cut the said two strips (8,28) simultaneously;

activating the said joining unit (25) so as to join one end of the said second strip (28) upstream from a cutting line (27) on the said cutting unit (34) to one end of the said first strip (8) downstream from the said cutting line (27); and

restarting the said feed unit (14).

4,555,282

METHOD OF AND MEANS FOR BONDING SYNTHETIC RESIN PROFILED FASTENERS TO FILM SUBSTRATE

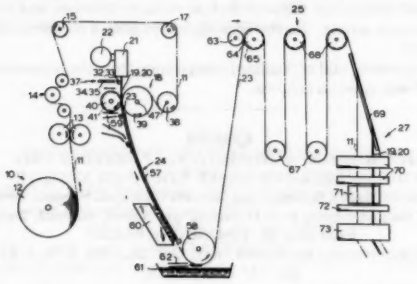
Mitsuru Yano, Shizuoka, Japan, assignor to Seisan Nippon Sha, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 380,832, May 21, 1982, abandoned. This application Dec. 28, 1983, Ser. No. 566,196

Claims priority, application Japan, May 28, 1981, 56-080190

Int. Cl.⁴ B29D *5/00*

U.S. Cl. 156—66 **32 Claims**



1. A method of fusion bonding a continuous freshly extruded low melt viscosity synthetic thermoplastic resin fastener strip having a fastener profile portion and a base portion opposite the profile, to a continuously running prefabricated film substrate, which comprises:

advancing the prefabricated substrate continuously through a bonding zone in which the substrate is directed to run downwardly;

effecting continuous direct free running transit of the fastener strip downwardly from thermoplastic extruder means through a short transit distance to said bonding zone located below said extruder means, so that in such short transit distance said fastener strip as a whole would tend to retain substantial residual thermoplastic fusion temperature;

in said free running short transit distance, and before the fastener strip reaches said bonding zone, selectively chilling and thereby solidifying and stabilizing said fastener profile portion of the transitting fastener strip, and thereby preventing deformation of said profile but leaving said base portion at sufficient residual fusion temperature to remain thermoplastic to said bonding zone;

at the downstream end of said short transit distance and beyond said chilling step effecting assembly of the still thermoplastic base portion of the otherwise solidified strip with said substrate in said bonding zone, and in said bonding zone pressing the assembled downwardly running strip and substrate together and thereby effecting fusion bonding of said thermoplastic base portion to said substrate;

and downstream from said bonding zone setting and curing the bonded assembly.

4,555,283

METHOD OF FORMING A STORAGE TANK FOR BITUMEN IN THE LIQUID STATE

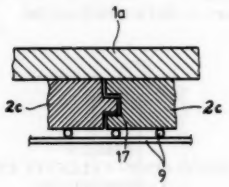
Klaus Thesenfitz, Winsen, Fed. Rep. of Germany, assignor to Linhoff & Thesenfitz Maschinenbau GmbH, Winsen, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,510

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218135; Jul. 2, 1982, 3224869

Int. Cl.⁴ E04B *2/20*

U.S. Cl. 156—71 **16 Claims**



1. A method of fabricating a storage tank for liquid bitumen comprising the steps of:

assembling a steel shell of individual steel panels to surround a liquid bitumen holding volume,

inserting glass foam panels into the shell, adjacent to the interior surface of the shell, and leaving labyrinthian gaps between the individual panels,

leaving the gaps empty of any material during fabrication of the storage tank, and

filling the holding volume with liquid bitumen so that the latter fills the gaps and solidifies therein to permanently interconnect the glass foam panels to thereby form a wall layer to contain the remaining liquid bitumen within said holding volume.

4,555,284

METHOD OF USING A FOAMABLE HOT-MELT ADHESIVE FOR SEALING

Ferdinand Quella, Gauting, and Bernd Steinwender, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 8, 1983, Ser. No. 464,912

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3211067

Int. Cl.⁴ B32B *31/14, 5/20*

U.S. Cl. 156—79 **8 Claims**

2. A method of sealing communication cable structure ends comprising:

coating a foamable hot-melt adhesive, comprised of substantially uniform admixture of a per se known molten thermoplastic adhesive having a melting temperature in the range of about 100° C. and a thermally decomposable solid foaming additive in said molten adhesive having a decomposition temperature above the melting range of said adhesive, onto end portion to be sealed; said foaming

additive being selected from the group consisting of 1,1'-diacetoxy-1,1'-azocyclohexane; 2,2'-diacetoxy-2,2'-azopropane; and 4,4'-dimethyl-4,4'-azobutyrolactone; and

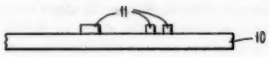
heating the so-coated end portions to a temperature above the decomposition temperature of said foaming additive so that a foam is generated on said end portions and, which bonds and seals said end portions.

4,555,285

FORMING PATTERNS IN METALLIC OR CERAMIC SUBSTRATES

Dudley A. Chance, Danbury; Timothy C. Reiley, Ridgefield, both of Conn., and Michael Sampogna, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,373
Int. Cl.[4] C04B *37/00*
U.S. Cl. 156—89 **20 Claims**



1. A method for forming a pattern in a metallic or ceramic substrate which comprises:

(a) providing a composite of a layer of photosensitive material on a backing;

(b) exposing said layer of photosensitive material to actinic radiation in a predetermined pattern;

(c) developing said layer of photosensitive material to leave the predetermined pattern on said backing;

(d) then laminating together said composite and a substrate in the green stage containing metallic particles or ceramic particles or combinations thereof with the developed photosensitive side of the composite confronting the surface of said substrate, thereby embedding the predetermined patterns of photosensitive material into said substrate in said green stage; and

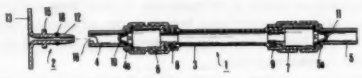
(e) subjecting the substrate to elevated temperature sufficient to cause sintering of the particles in said substrate and removal of the photosensitive material, thereby resulting in embedding the said pattern into the sintered metallic or ceramic substrate.

4,555,286

APPARATUS FOR AND A METHOD OF REPAIRING BY FILLING WITH AN ADHESIVE

Wataru Orikasa; Kunio Tochimoto; Tomoyuki Mori; Masayoshi Shigetomi; Katsuji Yamaga; Masaaki Matsui, and Hiroshi Saito, all of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation; Sho-Bond Construction Co., Ltd. and Communication Architecture and Building Research Corporation, all of Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,843
Claims priority, application Japan, Aug. 17, 1984, 59-171315
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—94 **6 Claims**



1. An apparatus for filling an adhesive in the portions of a structure to be repaired by filling an adhesive therein, comprising an injector and a support portion, said injector including a pressure buffer tube with coupler members at both ends thereof and check valves between both ends of said pressure buffer tube and said coupler members, said check valves being so actuated by the pressure from the pressure buffer tube as to close the passage of adhesive through the pressure buffer tube and the coupler member while said check valves being so actuated by the pressure from the coupler member side as to open said passage, said support portion including a coupler projection and a base member, said coupler projection having a passage therethrough and serving to press one of said check valves upon connecting said injector to said support portion to restore said passage of adhesive.

3. A method of filling an adhesive in the portion of a structure to be repaired by filling an adhesive therein, using the apparatus as described in claim 1, comprising feeding an adhesive in the pressure buffer tube through one of the coupler members so as to swell the pressure buffer tube, connecting the coupler member of the fed injector to the coupler projection of the support portion fixed on the portion of a structure to be repaired, whereupon one of the check valves is pressed by the coupler projection of the support portion to restore the passage through the pressure buffer tube, the coupler member and the portion of a structure to be repaired, thereby allowing the adhesive to be filled in the portion of a structure by the gradual and continuous contraction of the pressure buffer tube.

4,555,287

METHOD FOR BUILDING TIRES

Anthony G. Goodfellow, Maghull, England, assignor to W & A Bates Ltd., London, England

Filed Jun. 11, 1984, Ser. No. 619,182
Claims priority, application United Kingdom, Jun. 29, 1983, 8317687
Int. Cl.[4] B29H *17/02, 17/37*
U.S. Cl. 156—127 **4 Claims**

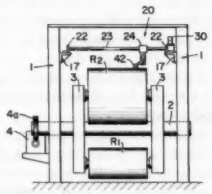
1. A method of building a pneumatic tire comprising separately building an unexpanded carcass assembly and an annular tread assembly comprising tread rubber, breaker reinforcement and sidewall rubbers wherein the sidewall rubbers are separate and are each formed with a notched edge to engage and adhere to the tread and breaker, positioning the tread assembly and the carcass assembly in coaxial relationship with the unexpanded carcass disposed centrally within the tread assembly, expanding the carcass into engagement with the tread assembly and consolidating the two assemblies together.

4,555,288

METHOD OF AND DEVICE FOR PREPARING PAPER ROLLS FOR ROTARY PRESSES AND THE LIKE

Yoshiki Nozaka, Tokyo, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,528
Claims priority, application Japan, Jun. 20, 1983, 58-110665
Int. Cl.[4] B31F *5/06*; B65H *19/18*
U.S. Cl. 156—191 **2 Claims**



1. A method of preparing a new paper roll for a rotary press or the like, which method comprises the steps of: preparing a strong adhesive tape having on one surface thereof a central nontacky zone and adhesive tacky zones flanking opposites of the nontacky zone; sticking beforehand, upon completion of reeling of paper to form the roll, a plurality of pieces of the adhesive tape over and to the web end and the part of the roll adjacent thereto so that the nontacky zone of each tape piece is disposed over and along the web leading edge of the roll; and, after the roll has been loaded onto a paper feed apparatus

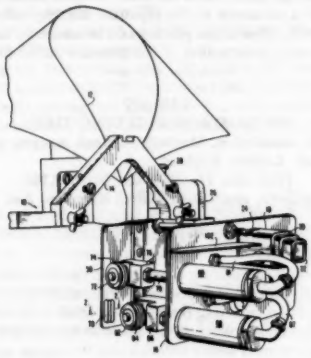
including web splicing means, forming from the outside a perforated line for tearing across each tape piece in the non-tacky zone thereof substantially in the vicinity of and along the web leading edge thereby to facilitate tearing of the tape pieces and peeling of the web leading edge part immediately prior to web splicing.

4,555,289

METHOD AND APPARATUS FORMING FIN-TYPE BACK SEAL USING COHESIVE SEALANTS WITHOUT EXTERNALLY APPLIED HEAT

William D. Kreager, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Jun. 1, 1983, Ser. No. 500,189
Int. Cl.[4] B29D *23/10*
U.S. Cl. 156—203 **11 Claims**



1. Apparatus for providing and forming a cold, fin-type back seal on cohesively edge-striped packaging material used on a vertical or slant form-and-fill machine of the type that forms a web to bring the edges together for sealing and moves the web intermittently through forming and filling stages, the apparatus comprising:

(a) support means attachable to the form-and-fill machine;

(b) a tucker plate carried by the support means and positioned to receive the cohesively striped edges of the web;

(c) a guide means cooperating with the edges of the web on the tucker plate and guiding such to a cold sealing zone on the tucker plate during the longitudinal movement of the web; and,

(d) a cold-seal-forming assembly at the cold sealing zone, the cold-seal-forming assembly including means on each side of the web for forming a slight corrugation in the cohesively striped edge to provide a good fin seal without the application of externally applied heat.

11. The method of providing a fin-type back seal on packaging material used in a vertical or slant form-and-fill packaging machine, the method comprising:

(a) providing cohesive coating stripes on one side of the longitudinal edges of packaging material being fed through a vertical form-and-fill type package machine;

(b) forming the web containing such cohesive striped coating materials so that the cohesive stripes are juxtapositioned and in contact to provide a longitudinal fin seal area on the packaging material;

(c) guiding the seal area on the packaging material to a cold sealing zone; and,

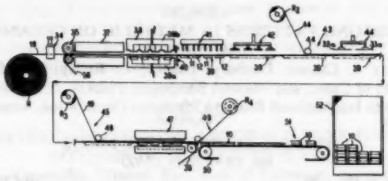
(d) in the cold sealing zone applying an adjustably constant rolling pressure to develop a corrugation in the fin seal without the application of external heat and thereby activating the cohesives to provide a longitudinal fin seal on the packaging material during motion of the packaging material through the form-and-fill packaging machine.

4,555,290

METHOD OF MAKING CASSETTE HOLDERS

Herbert Graetz, Chicago, Ill., and Ronald C. Unterreiner, Cape Girardeau, Mo., assignors to Blair Industries, Inc., Scott City, Mo.

Filed Apr. 19, 1984, Ser. No. 601,949
Int. Cl.[4] B29C *3/04*
U.S. Cl. 156—245 **21 Claims**



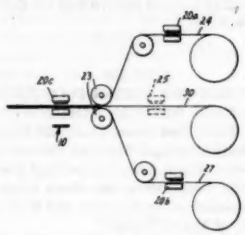
1. The method of making book style albums which comprises unwinding a first thermoplastic sheet from a roll, heating the sheet, thermal forming the sheet to define a plurality of pairs of trays and lids in side-by-side relation connected by flexible spines with open top pockets surrounding the bottom faces of the trays, depositing rigid slabs in said pockets to cover said bottoms, unwinding a second thermoplastic sheet from a roll, covering the thermal formed first sheet with said second sheet, unwinding a third thermoplastic sheet, covering the second sheet on the thermal formed first sheet with said third sheet, bonding the sheets together forming a continuous web of albums, severing the separate albums from the web, winding the web into a roll, and conveying the albums to an inspection station.

4,555,291

METHOD OF CONSTRUCTING AN LC NETWORK

William C. Tait, and Lanny L. Harklau, both of Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 256,934, Apr. 23, 1981, abandoned. This application May 17, 1984, Ser. No. 611,093
Int. Cl.[4] H03H *1/00, 3/00, 7/01*
U.S. Cl. 156—250 **5 Claims**



1. A method of constructing an LC network comprising,

cutting and removing a predetermined pattern from a first conductive sheet, leaving a conductive path having an essentially coil-like configuration of windings with a plurality of interconnections between the adjacent windings of the configuration, which interconnections add rigidity to the conductive sheet,

cutting and removing a predetermined pattern from a second conductive sheet, leaving a conductive path having as essentially coil-like configuration of windings with a plurality of interconnections between the adjacent windings of the configuration, which interconnections also add rigidity to the second conductive sheet,

forming at least one capacitor by orienting the first and second conductive sheets with respect to each other and laminating these conductive sheets to opposing faces of a non-conductive sheet with at least one portion of the

conductive paths on the first conductive sheet substantially aligned with at least one portion of the conductive paths on the second conductive sheet, but with the aligned portions separated from each other by the non-conductive sheet, and,

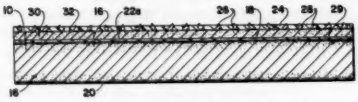
cutting from the lamination formed by said above steps to eliminate at least some of the interconnections between the adjacent spirals on each of the conductive sheets, and leaving at least one continuous portion of the conductive path on the conductive sheets which is in the configuration of a coil and in which the adjacent windings are no longer interconnected.

4,555,292

METHOD OF FORMING A NON-SKID SURFACE WOOD PANEL

Thomas L. Thompson, Costa Mesa, Calif., assignor to Thom-McI, Inc., Balboa, Calif.

Filed Feb. 16, 1984, Ser. No. 580,839
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—279 **1 Claim**



1. A method of forming a non-skid-surfaced plywood panel having a permanent but flexible bond between said plywood and the elements thereof, wherein the method comprises the steps of:

providing a sheet of plywood having substantially flat opposite surfaces;

applying to each of said surfaces a first coat of low-viscosity, catalized, epoxy resin so as to penetrate and seal said surfaces;

applying a second coat of a catalyzed epoxy resin to the upper surface of said plywood panel prior to the drying of said first coat of epoxy resin, said second coat having a higher viscosity than said first coat;

providing a fiber/cement panel having substantially the same configuration as said plywood panel;

applying a third coat consisting of the same catalyzed epoxy resin used in said second coat to one surface of said fiber/cement panel;

placing said coated surfaces of each panel into opposing engagement with each other;

applying pressure to said panels, whereby excess epoxy material is forced from between said panels;

allowing said epoxy between said panels to dry;

applying at a predetermined thickness a fourth coat of pigmented polyurethane material to form a surface layer over the exposed surface of said fiber/cement panel;

disseminating a hard grit material over said fourth coat while said polyurethane material is still in a wet stage, said grit material being of a size greater than the thickness of said fourth coat, so as to allow a portion of said grit to be exposed above the surface of said fourth coat; and

allowing said polyurethane coat to dry, thereby securing said grit material within said fourth coat.

4,555,293

METHOD AND APPARATUS FOR THERMO-BONDING SEAMS IN THERMOPLASTIC MATERIAL

Robert C. French, 22845 Willard, El Toro, Calif. 92630

Filed Jul. 26, 1983, Ser. No. 517,824
Int. Cl.⁴ C09J *5/00, 7/00*
U.S. Cl. 156—308.4 **9 Claims**

1. A method of sealing thermoplastic material which comprises the steps of:

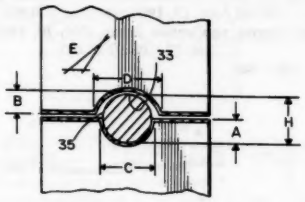
providing a support for the thermoplastic material to be sealed;

providing a pressure means for applying pressure on the thermoplastic material to be sealed;

providing a heat element in the configuration of a desired seam to be formed;

at least one of said pressure means and said heat element having a recessed wall configured to define a confined melt zone volume between said pressure means and said heat element;

providing said confined melt zone volume between the pressure means and the heat element when the pressure means and heat element are in mating relationship and are operating with the thermoplastic material;



introducing the thermoplastic material to be sealed between the pressure means and the heat element;

applying pressure on one side of the thermoplastic material by the pressure means while the heat element on the opposite side of the thermoplastic material is operating to provide heat to the thermoplastic material to melt the thermoplastic material in the configuration of the desired seam and force the melted thermoplastic to flow into and be confined within the melt zone volume; and

maintaining said confined melt zone volume between the pressure means and the heat element throughout the time that the heat element is operating to provide heat to the thermoplastic material.

4,555,294

INORGANIC COMPOSITION ADAPTED FOR USE IN BONDING A HIGH TEMPERATURE RESISTANT POLYMERIC MATERIAL TO AN ALUMINUM BASE SUBSTRATE

Kenneth J. Adams, Novelty, and David E. Dyke, Shaker Heights, both of Ohio, assignors to Imperial Clevite Inc., Glenview, Ill.

Filed Apr. 3, 1984, Ser. No. 596,319
Int. Cl.⁴ B32B *31/20*
U.S. Cl. 156—309.6 **7 Claims**

1. A method of bonding a high temperature resistant polymeric material to an aluminum base substrate is provided which comprises:

providing a reaction product which is obtained by reacting chromium sesquioxide with a second inorganic compound containing at least one element selected from the group consisting essentially of calcium, barium and strontium to form a reaction product chromite XCr_2O_4 wherein X is selected from the group essentially consisting of calcium, barium and stronium;

bringing the so-obtained reaction product into contact with the surface of the aluminum base substrate which is to be coated with the polymeric material;

bringing at least one high temperature polymeric material selected from the group consisting essentially of polysulfone, polyethersulfone, polyamide-imide, polyetheretherketone, polyetherimide, polyphenylene sulfide, polyphenylsulfone and polymeric compounds containing them into contact with the surface of the substrate which is to be coated;

heating the so-applied polymeric material and reaction prod-

uct to a temperature sufficient to cause the polymeric material to flow and cover that portion of the substrate which is to be coated therewith; and

cooling the heated cooling to a temperature sufficient to cause the high temperature resistant polymeric material to become adherently bonded to the substrate.

4,555,295

ADHESIVE FILLER APPARATUS

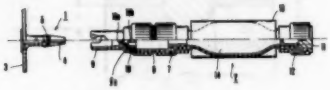
Wataru Orikasa; Makoto Ohara; Tomoyuki Mori; Masayoshi Shigetomi; Katsuji Yamaga; Masaaki Matsui; Hiroshi Saito, and Hiroshi Soda, all of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation; Sho-Bond Construction Co., Ltd. and Communication Architecture and Building Research Corporation, all of Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,844

Claims priority, application Japan, Dec. 20, 1983, 58-238973

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—349 **2 Claims**



1. An adhesive filler apparatus comprising a support portion provided at one end with a base member for locating the support portion on the portion which is to be repaired by filling an adhesive therein and at the other end with a tubular coupler projection, an injector including a pressure buffer tube, a tubular coupler member at one end of said pressure buffer tube for connecting the injector to said support portion, and a valve device between said pressure buffer tube and coupler member, the other end of said pressure buffer tube being made capable of being closed, the closure provided by said valve device being cleared upon connecting said coupler member to said coupler projection.

4,555,296

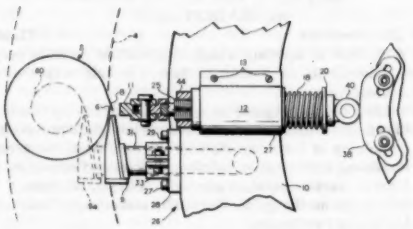
UNIVERSAL HOT AIR NOZZLE AND SEAL BAR WITH ADJUSTABLE CAM

John E. Burtch, Curtice, and James A. Hill, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 8, 1984, Ser. No. 669,509

Int. Cl.[4] B65C *3/12*

U.S. Cl. 156—446 **11 Claims**



1. An apparatus for forming and assembling tubular thermoplastic sleeves, the apparatus having a circumferentially movable turret with a plurality of mandrels forming work stations thereon, wherein at one of the work stations each mandrel has a heat nozzle and a seal bar and the sleeve is wrapped around the coacting mandrel with the vertical edges of the sleeve being disposed in overlapping relation with heat being applied by the heat nozzle to the overlapped edges in coaction with the seal bar being subsequently applied to the heated overlapped edges with preselected pressure to heat-seal such edges together, the improvement thereon comprising; longitudinally telescoping means upon which the seal bar is mounted adjacent the turret enabling the seal bar to selectively contact the sleeve vertical edges with preselected pressure.

4,555,297

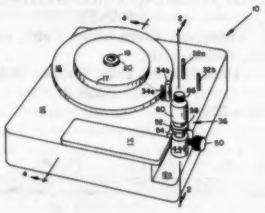
FOIL APPLICATOR

Robert E. Andrus, San Antonio, Tex., and Steve Hampton, 1906 Elsworthy, San Antonio, Tex. 78248, assignors to Steve Hampton, San Antonio, Tex.

Filed May 23, 1984, Ser. No. 613,333

Int. Cl.[4] B29C *17/00*

U.S. Cl. 156—461 **3 Claims**



1. Apparatus for applying foil to a portion of a glass plane, comprising:

a horizontal base;

a turntable for receiving said foil thereon rotably mounted atop said base;

a horizontal platform fixedly mounted atop said base adapted to receive said glass portion thereon; and

a dual adjustment applicator head mounted to said base in operative proximity to said platform, comprising:

a foil support;

means for vertically adjusting said foil support relative to said platform, said means for vertically adjusting said foil support comprising a downwardly extending bushing integral with said foil support in threaded engagement with a threaded portion of an upstanding bolt;

a guide bushing; and

means for vertically adjusting said guide bushing relative to said platform and said foil support.

4,555,298

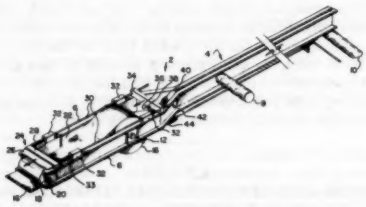
TAPE GUN

Ray Boucher, Perkinsfield, Canada, assignor to Bay Mills Limited, Canada

Filed May 18, 1984, Ser. No. 611,716

Int. Cl.[4] B44C *7/02*

U.S. Cl. 156—523 **8 Claims**



1. A device for dispensing and applying adhesive tape from rolls, the device comprising:

(a) a frame consisting of a pair of spaced parallel arms connected to an elongated handle parallel thereto;

(b) a roller supported between the arms intermediate their

free ends and the handle to support rotatably a roll of said tape;

(c) an applicator roller positioned transversely between the arms near their free ends, this roller to roll and press the tape, during use, into final position and being provided with a roller surface to frictional engage the tape as the roller rotates, to draw tape from the tape roll;

(d) knife means operatively positioned near the free ends of the arms, having a blade facing forwardly with respect to the arms and handle and positioned transversely across the arms above the applicator roller, the knife means movable in a direction parallel to the arms between withdrawn position wherein the knife means does not obstruct the dispensing and applying of tape from the device, and extended cutting position in which the blade extends forwardly from the ends of the arms beyond the applicator roller to permit cutting the tape transversely the knife means being biased towards extending cutting position, and provided with restraining means comprising a pawl pivotably secured to the frame to releasably engage the knife means to releasably hold it in withdrawn position, the restraining means being purposefully manipulable by the operator to release the knife means from being held by the restraining means; and

(e) guide means secured to the arms near their free end to receive tape from the roll and direct it towards the ends of the arms below the applicator roller.

4,555,299

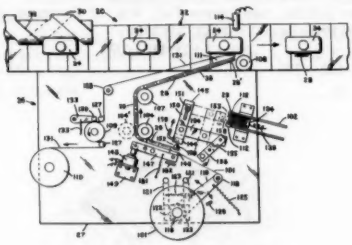
LITERATURE APPLYING MECHANISM

Helmut Voltmer, Park Ridge; Alfred F. Schwenzer, Totowa, and Edward J. Mazur, Montville, all of N.J., assignors to NJM, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 542,731, Oct. 17, 1983, Pat. No. 4,502,910. This application Jul. 9, 1984, Ser. No. 628,761

Int. Cl.[4] B65C *9/40*

U.S. Cl. 156—552 **10 Claims**



8. A system for applying a piece of literature to an object, said system comprising:

means for pressing the piece of literature against the object;

a hopper for storing pieces of literature;

means for moving a tape having an adhesive coating to said pressing means;

suction cup means movable between a first position in which said suction cup means picks up, by a vacuum, the piece of literature from said hopper and a second position in which said suction cup means delivers said piece of literature onto said adhesive coating of said tape and said vacuum is terminated; and

means disposed adjacent said second position for urging said tape toward said suction cup means and against said piece of literature as said suction cup means deliver said piece of literature onto said adhesive coating of said tape.

4,555,300

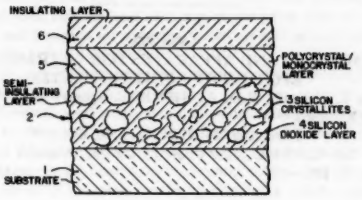
METHOD FOR PRODUCING SINGLE CRYSTAL LAYERS ON INSULATORS

Emil Arnold, Chappaqua; Helmut Baumgart, and Barbara A. Rossi, both of Mahopac, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Feb. 21, 1984, Ser. No. 581,752

Int. Cl.[4] C30B *25/06*

U.S. Cl. 156—613 **4 Claims**



1. A method for producing single crystal layers on an insulating layer comprising;

forming a first insulating substrate layer,

forming a semi-insulating film of small silicon crystallites embedded into a second insulating layer of silicon dioxide on said first insulating substrate layer, said semi-insulating film being a silicon-rich oxide layer, and said semi-insulating film having a coefficient of thermal expansion intermediate that of silicon and silicon dioxide,

depositing a polycrystalline semiconductor film of silicon onto said semi-insulating film,

forming a third insulating layer on said polycrystalline semiconductor film, and

converting said polycrystalline semiconductor film to a single crystal film.

4,555,301

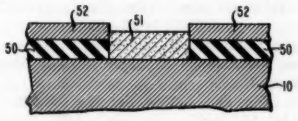
FORMATION OF HETEROSTRUCTURES BY PULSED MELTING OF PRECURSOR MATERIAL

John M. Gibson, Upper Montclair; Dale C. Jacobson, Independence Township, Warren County; John M. Poate, Summit, and Raymond T. Tung, Berkeley Heights, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 20, 1983, Ser. No. 506,069

Int. Cl.[4] C30B *1/08*

U.S. Cl. 156—617 R **17 Claims**



1. Method of producing a heterostructure comprising a layer of multiconstituent first material on a single crystal second material substrate, the first material comprising at least a first major constituent and a second major constituent, chemical elements A and B being the first and second major constituent, respectively, the chemical composition of the substrate differing from the chemical composition of the first material, the first material selected from the group consisting of the metals, the semiconductors, and the insulators, the second material selected from the group consisting of Si, Ge, the III-V compound semiconductors, and the II-VI compound semiconductors, the method comprising

(a) providing the single crystal second material substrate;

(b) forming a layer of precursor material on at least a part of the substrate, the precursor material having the same major constituents as the first material,

(c) melting momentarily at least a part of the precursor material by causing pulsed radiation to be incident on the precursor material, the pulsed radiation being electromagnetic radiation, or electron beam radiation, or ion beam radiation, the incident pulsed radiation adjusted to melt the part of the precursor material to at least the substrate/-precursor material interface, and

(d) permitting the melted precursor material to re-solidify, the re-solidified material being said first material.

4,555,302

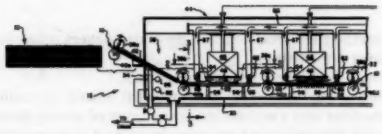
METHOD AND APPARATUS FOR ULTRASONIC ETCHING OF PRINTING PLATES

John C. Urbanik, R.D. #1 3451 Stone Quarry Rd., Fredonia, N.Y. 14063

Filed Aug. 24, 1984, Ser. No. 644,177

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00, 25/06;* **B41C** *1/00*

U.S. Cl. 156—637 **13 Claims**



1. In a process for etching a light-sensitive photopolymerisable surface of a printing plate after exposure including the following steps:

providing a bath of etching fluid;

conveying a printing plate in a prescribed path with at least a surface to be etched being in contact with the bath of etching fluid;

forming longitudinal waves in the etching fluid at generally right angles to the surface of the printing plate, the waves being of a suitable wave length and amplitude to normally cause substantial cavitation adjacent the surface of the printing plate to be etched;

the improvement being characterized by

sweeping the surface to be etched with a flow of etching fluid at a substantial angle to the longitudinal waves and of a sufficient velocity and volume to prevent substantial cavitational erosion of the surface to be etched.

4,555,303

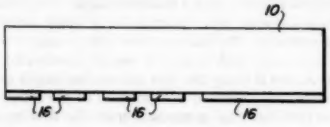
OXIDATION OF MATERIAL IN HIGH PRESSURE OXYGEN PLASMA

Ronald Legge, Scottsdale; M. John Rice, Jr., Tempe, and Kalluri R. Sarma, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1984, Ser. No. 656,822

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **15 Claims**



1. A process for removing graphite from a surface which comprises the steps of: providing a surface having a layer of graphite adherent thereto; positioning said surface and said layer of graphite in a reaction volume; generating a high pressure rf plasma comprising reactive oxygen species; directing said reactive oxygen species to said layer of graphite; and oxidizing said layer of graphite.

4,555,304

METHOD OF POLISHING GLASS ARTICLES IN AN ACID BATH

Erich Sülzle, Nadistrasse 8, D-8000 München 40, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 537,209

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3238011; Jun. 24, 1983, 3322875

Int. Cl.⁴ C03C *15/02*

U.S. Cl. 156—663 **16 Claims**

1. A method of polishing glass articles comprising

providing a polishing bath of acids consisting essentially of (1) 35–75% by weight of bath of sulfuric acid, (2) 1.5–12% by weight of bath of hydrofluoric acid, and (3) an amount of at least one non-oxidizing organic acid which is stronger than HF sufficient to hinder the dissociation of HF and thereby retard the formation of fluoride ions in the bath;

contacting glass articles to be polished with said polishing bath for a time sufficient to effect polishing of said glass, whereby deposits forming during polishing are in fine form with poor adhesive capacity on the glass surface;

avoiding the substantial presence in the bath of fluorosilicic acid which serves to remove alkali metal ions in the form of precipitates of alkali metal silico-fluorides; and

repeatedly contacting glass articles with said bath over a normal working shift of about 8 hours and, upon decrease in the effectiveness of said polishing bath or the appearance of polishing flaws due to reduction of bath effectiveness, adding to the bath 0.1 to 5 g of sodium chloride and/or potassium chloride per liter of polishing bath without otherwise renewing or cleansing said bath over said shift.

4,555,305

APPARATUS AND METHOD FOR COOLING A BELT PRESSING UNIT IN A PAPER MACHINE

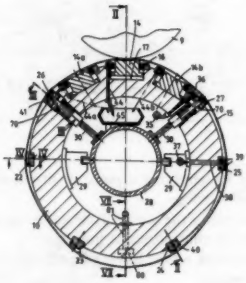
Karl Steiner, Herbrechtingen; Christian Schiel, Heidenheim; Albrecht Meinecke, Heidenheim; Josef Müllner, Heidenheim, and Hans Weiss, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,628

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3311996; May 13, 1983, 3317456

Int. Cl.⁴ D21F *3/02*

U.S. Cl. 162—205 **37 Claims**



1. A method of guiding a stream of liquid through a belt press unit, comprising the steps of:

rotating a tubular elastic press belt around a supporting body in a direction of travel, the supporting body having an outer surface and the press belt being generally spaced apart from the outer surface of the supporting body as the press belt rotates; pressing the press belt against a web between a pressing surface inside the press belt and an opposing surface outside the press belt in a pressing zone;

feeding a cooling stream of a liquid to the inner side of the tubular press belt at a main feed position near the pressing zone and downstream from the pressing zone when viewed in the direction of travel;

leaving the liquid on the inner side of the press belt for cooling the press belt as the press belt travels from the main feed position most of the way around the supporting body; and

removing at least part of the liquid from the inner side of the press belt at a removal position near the pressing zone and upstream from the pressing zone when viewed in the direction of travel.

11. A belt press unit comprising:

a supporting body having an outer surface;

a tubular elastic press belt around and movable around the outer surface of the supporting body, the press belt being generally spaced apart from the outer surface of the supporting body as the press belt moves around the supporting body;

a pressing means on the outer surface of the supporting body for pressing the press belt outward for pressing a web between the press belt and an opposing surface outside the press belt, the pressing means defining a pressing zone, the press belt moving around the supporting body in a direction of travel and moving with the web between the pressing means and the opposing surface;

feeding means for feeding liquid to the inner side of the press belt at a main feed position near the pressing zone and downstream from the pressing zone when viewed in the direction of travel;

means for permitting the liquid to remain on the inner side of the press belt for cooling the press belt as the press belt travels from the main feed position most of the way around the supporting body; and

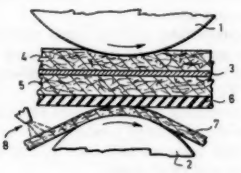
means for removing at least part of the liquid from the inner side of the press belt from at least one removal position near the pressing zone and upstream from the pressing zone when viewed in the direction of travel.

4,555,306

METHOD AND MEANS FOR REMOVING WATER FROM A WEB IN A PRESS OF A PAPERMAKING MACHINE

Kristian Lundström, Soljala, Finland, assignor to Tamfelt Oy Ab, Finland

Filed Sep. 24, 1984, Ser. No. 653,815
Claims priority, application Finland, Oct. 3, 1983, 833583
Int. Cl.⁴ D21F *3/02, 3/06, 1/10*
U.S. Cl. 162—205 **12 Claims**



1. A method for removing water from a web in a press of a papermaking machine comprising:

passing a web to be dried between two press felts through a press nip formed between two press rolls;

passing a resilient water-impermeable mat through the press nip, said mat being in contact with one of the press felts;

passing a wire between the resilient mat and one of the press rolls through the press nip, said wire being in contact with said mat and said one of the press rolls at the press nip;

spraying water on said wire immediately before the press nip so that the wire becomes completely saturated; and

retaining said water in voids formed by weft and warp yarns within said wire that prevent water from moving in the direction of movement of the wire as the wire passes through said press nip thereby providing a water cushion in the section of the wire lying between the press roll and the resilient mat.

3. A wire in combination with a press of a papermaking machine, said press having a press nip formed between two press rolls and a web to be dried located between two press felts together with a resilient water-impermeable mat in contact with one of the press felts, means for passing said web, felts, and mat through the press nip, means for passing said wire between the mat and one of the press rolls, said wire being in contact with the mat and said one of the press rolls at the press nip and a means for spraying water on said wire located immediately before said press nip,

said wire comprising warp yarns arranged along the longitudinal direction of the wire; and

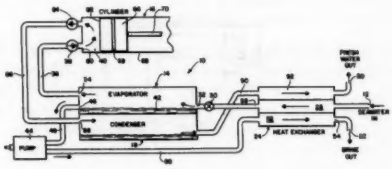
cross-direction weft yarns arranged substantially perpendicular to the warp yarns thereby forming voids that retain water whereby as said wire is passed through said press nip water is prevented from moving in the direction of movement of the wire, thereby producing a water cushion in the section of the wire lying between the press roll and the resilient mat.

4,555,307

SEA WATER DISTILLATION SYSTEM

Glenn E. Hagen, New Orleans, La., assignor to Williams, Inc., New Orleans, La.

Filed Jul. 20, 1983, Ser. No. 515,471
Int. Cl.⁴ C02F *1/04;* **F04B** *17/00*
U.S. Cl. 202—177 **5 Claims**



1. A system for the distillation of impure aqueous solutions comprising:

impure aqueous solution input means for delivering said impure aqueous solution from a source to said system, said impure aqueous solution of the type capable of distillation through evaporation and condensation processes;

evaporation means communicating with said impure aqueous solution input means for causing said impure aqueous solution to form a gaseous portion;

work extracting means responsive to the wave motion of a liquid, said work extracting means being in communication with said evaporation means such that said gaseous portion can pass therebetween, said work extracting means capable of imparting pressure upon said gaseous portion, said work extracting means comprising:

a first float;

a second float pivotally connected to said first float said first float including an arm extending from said first float a distance beyond the point of connection of said first float and said second float;

a cylinder for receipt of said gaseous portion, said cylinder being pivotally connected to the exterior of said second float;

a piston slideably engaging the interior of said cylinder; and

a piston rod attached to and extending from said piston, said piston rod pivotally connected to said arm of said first float such that said piston moves within said cylinder in relation to the wave motion imparted to said first float;

condensation means communicating with said work extracting means, said condensation means capable of bringing said gaseous portion to a liquid state;

distilled solution output means communicating with said condensation means for removal of the generally pure distilled solution from said system; and

impure solution output means communicating with said evaporation means for the removal of the non-distilled portion of said impure aqueous solution.

4,555,308

GAS COLLECTING HOOD FOR COLLECTING EMISSIONS DURING COKE DISCHARGE OPERATIONS

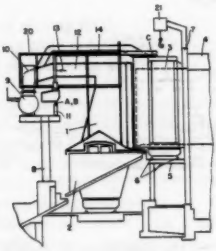
Engelbert Bruns, Recklinghausen, and Gerd Osterholt, Dorsten, both of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. K.G., Fed. Rep. of Germany

Filed Jul. 24, 1984, Ser. No. 633,862

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3326971

Int. Cl.[4] C10B *33/14, 27/00*

U.S. Cl. 202—263 **4 Claims**



1. In a coke oven battery having a coke guide mounted for movement in a longitudinal direction across the coke oven battery, the improvement comprising:

a support structure spaced laterally of the coke guide and extending in a longitudinal direction;

a rail mounted on said support structure extending in the longitudinal direction;

a gas collecting hood for collecting emissions during a discharge of coke from the coke oven battery over the coke guide;

a hood frame connected to said hood for supporting said hood;

two spaced apart roller means connected to said hood frame on a side of said hood frame and said hood remote from the coke guide, said roller means engaged on top of said rail for supporting said hood; and

said hood frame including a single pivotal bearing means providing a one point support between said hood frame and the coke guide on a side of said hood frame and hood adjacent the coke guide whereby said hood is supported at three points, said frame being supported only at said roller means and bearing means, said pivotal bearing means comprising a bearing socket connected between said hood frame and the coke guide for universal pivoting, said bearing socket disposed on a top of the coke guide and near a center of said hood frame between said two roller means in the longitudinal direction.

4,555,309

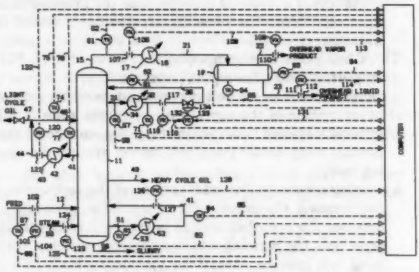
CONTROL OF A FRACTIONAL DISTILLATION PROCESS

Gyan P. Jain, Tulsa, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 19, 1983, Ser. No. 524,489

Int. Cl.[4] B01D *3/42*

U.S. Cl. 203—1 **24 Claims**



1. Apparatus comprising:

a fractional distillation column;

means for providing a feed stream containing hydrocarbons and inerts including hydrogen to said fractional distillation column;

a cooling means;

an overhead accumulator;

means for withdrawing an overhead vapor stream from an upper portion of said fractional distillation column and for passing said overhead vapor stream through said cooling means to said overhead accumulator;

means for withdrawing a vapor stream from said overhead accumulator as an overhead vapor product;

means for withdrawing a liquid stream from said overhead accumulator as an overhead liquid product;

means for providing an upper external reflux to said fractional distillation column;

means for establishing a first signal representative of the heat removed per unit of said feed stream by said fractional distillation column at a time T_2;

means for establishing a second signal representative of the heat removed per unit of said feed stream by said fractional distillation column at a time T_1 which is earlier in time than said time T_2;

means for establishing a third signal representative of the change in heat removed per unit of said feed stream by said fractional distillation column between said time T_2 and time T_1;

means for establising a fourth signal representative of any change in the hydrogen concentration in said overhead vapor stream between said time T_2 and said time T_1 in response to said third signal;

means for establishing a fifth signal representative of the actual moles of inerts contained in said overhead vapor stream at said time T_2 in response to said fourth signal;

means for establishing a sixth signal representative of the actual moles of hydrocarbon contained in said overhead vapor stream in response to said fourth signal;

means for establishing a seventh signal representative of the hydrocarbon partial pressure in the upper portion of said fractional distillation column in response to said fifth and sixth signals;

means for establishing an eighth signal representative of the equilibrium flash vaporization end point temperature (EFVEP) at said time T_2 for said overhead liquid product in response to said seventh signal;

means for establishing a ninth signal representative of the

actual moles of inerts in said overhead vapor stream at said time T_2 in response to said fourth signal;

means for establishing a tenth signal representative of the hydrocarbon partial pressure in said overhead accumulator in response to said ninth signal and said sixth signal;

means for establishing an eleventh signal representative of the equilibrium flash vaporization initial point temperature (EFVIP) for said overhead liquid product at said time T_2 in response to said tenth signal;

means for establishing a twelfth signal representative of the slope of the equilibrium flash vaporization boiling point line for said overhead liquid product at said time T_2 in response to said eighth signal and said eleventh signal;

means for establishing a thirteenth signal representative of the actual slope of the ASTM boiling point curve for said overhead liquid product at said time T_2 in response to said twelfth signal;

means for establishing a fourteenth signal representative of the actual ASTM end point temperature for said overhead liquid product in response to said thirteenth signal;

means for establishing a fifteenth signal representative of the desired ASTM end point temperature for said overhead liquid product stream;

means for comparing said fourteenth signal and said fifteenth signal and for establishing a sixteenth signal which is responsive to the difference between said fourteenth signal and said fifteenth signal; and

means for manipulating the flow rate of said upper external reflux to said fractional distillation column in response to said sixteenth signal to thereby maintain the actual ASTM end point temperature of said overhead liquid product substantially equal to the desired ASTM end point temperature represented by said fifteenth signal.

4,555,310

METHOD OF UTILIZING ENERGY OF HIGH PRESSURE CONDENSATE

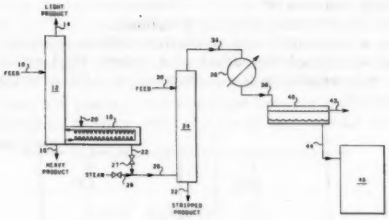
Ronald E. Marrelli, Bountiful, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1978, Ser. No. 938,189

The portion of the term of this patent subsequent to Jan. 26, 2000, has been disclaimed.

Int. Cl.[4] B01D *3/38*

U.S. Cl. 203—10 **13 Claims**



1. A method of utilizing the energy of high pressure steam, comprising:

(a) passing said high-pressure steam, at an elevated pressure of at least about 150 psig, in indirect heat exchange with a first feed material, to be heated in a heat exchange operation, under conditions to produce a high-pressure condensate stream, having a pressure of essentially said elevated pressure, from the condensation of said high pressure steam;

(b) reducing the pressure of said high-pressure condensate to a pressure sufficient to produce a low-pressure steam, having a pressure of about 7 psig;

(c) directly contacting a multicomponent second feed material, other than the thus heated first feed material, with the thus produced low-pressure steam, in at least one steam stripping operation, to strip at least one component from said multicomponent second feed material;

(d) condensing said low-pressure steam to produce an at least partially purified water stream, including the thus condensed low-pressure steam; and

(e) passing said at least partially purified water stream directly to a water utilization operation, as at least part of the water requirement thereof.

4,555,311

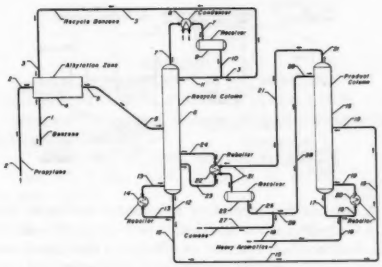
INTEGRATED FRACTIONATION IN THE RECOVERY OF ALKYLAROMATIC HYDROCARBONS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 18, 1983, Ser. No. 553,343

Int. Cl.[4] B01D *3/00;* **C07C** *3/54*

U.S. Cl. 203—21 **4 Claims**



1. A process for recovering an alkylaromatic hydrocarbon from the effluent stream of an aromatic hydrocarbon alkylation zone which comprises the steps of:

(a) passing an alkylation zone effluent stream which comprises a feed aromatic hydrocarbon, a product alkylaromatic hydrocarbon, and a by-product alkylaromatic having a higher boiling point than the product alkylaromatic hydrocarbon into a first fractionation column at a first intermediate point, with a first reboiler being located at the bottom of the first fractionation column;

(b) supplying heat to the first fractionation column by vaporizing bottoms liquid by indirect heat exchange in said first reboiler and passing the resultant vapors into the first fractionation column, with the resultant vapor having a first temperature;

(c) recovering a first net overhead product stream, which is rich in the feed aromatic hydrocarbon, from the first fractionation column;

(d) removing a first net bottoms stream, which is rich in the product alkylaromatic hydrocarbon, from the first fractionation column and passing the first net bottoms stream into a second fractionation column;

(e) removing a second net bottoms stream, which is rich in the by-product alkylaromatic hydrocarbon, from the second fractionation column;

(f) supplying additional heat to the first fractionation column by vaporizing process liquid withdrawn at a second intermediate point located below said first intermediate point and having a lower average boiling point than the bottoms liquid entering the first reboiler in a second reboiler, with the created vapor having a second temperature lower than said first temperature;

(g) passing a second overhead vapor stream, which is withdrawn from the second fractionation column and is rich in said product alkylaromatic hydrocarbon, through the second reboiler in indirect heat exchange relationship with said process liquid withdrawn at said second intermediate point, which results in vaporizing said process liquid

and at least partially condensing the second overhead vapor stream and thereby forming a condensate; and,

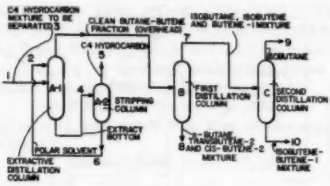
(h) withdrawing a first portion of said condensate as a product steam of the process and passing a second portion of said condensate into the second fractionation column as reflux.

4,555,312

PROCESS FOR SEPARATING HIGHLY PURE BUTENE-1 OR BUTENE-1/ISOBUTENE MIXTURE FROM C_4 HYDROCARBON FRACTION

Shunichiro Ogura, Tokyo, Japan; Masamichi Saremai, Yokohama, Japan, assignor to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Nov. 23, 1982, Ser. No. 444,039
Claims priority, application Japan, Nov. 27, 1981, 56-190385
Int. Cl.⁴ C07C *7/08*
U.S. Cl. 203—29 **6 Claims**



1. A process for separating a butene-1/isobutene mixture from a C_4 hydrocarbon fraction, which comprises subjecting the C_4 hydrocarbon fraction to extractive distillation using a polar solvent to separate components predominantly containing 1,3-butadiene as an extract bottom and obtain an overhead containing butanes, butene-1, isobutene and butene-2 as main components and being substantially free from C_3–C_4 diolefinic and acetylenic hydrocarbons, feeding the overhead into a first distillation column, removing n-butane and butene-2 as bottoms from the column, feeding low-boiling components from the top of the column into a second distillation column, removing isobutane from the top of the second distillation column, and obtaining highly pure butene-1 and isobutene from its bottom.

4,555,313

METHOD OF FORMING A CONTINUOUS POLYMERIC SKIN ON A CELLULAR FOAM MATERIAL

David V. Duchane, and Barry L. Barthell, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 21, 1982, Ser. No. 435,796
Int. Cl.⁴ C25D *1/08*; B05D *5/00*; B22D *19/02*
U.S. Cl. 204—3 **10 Claims**

1. A method of forming a thin, smooth continuous skin of a hydrophilic polymer on the outer surface of a hydrophobic cellular material, said method comprising:

(a) coating said outer surface said cellular material, which has an average cell size less than about 500 μm, in a wetting solution of said hydrophilic polymer and water, wherein said wetting solution has a surface tension within the range from about 35 to about 55 dynes/cm and a viscosity within the range from about 100 to about 3000 cP;

(b) removing said cellular material from said wetting solution and allowing the excess wetting solution to drain away from said cellular material; and

(c) drying the wetted surface of said cellular material to thereby remove by evaporation the water in the wetting solution on said surface, thereby forming a smooth continuous layer of said hydrophilic polymer on the outer surface of said cellular material.

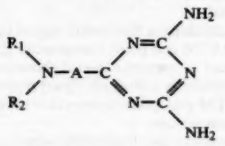
4,555,314

TIN-LEAD ALLOY PLATING BATH

Keigo Obata, Himeji; Nobuyasu Dohi, Kobe; Yoshiaki Okuhama, Kobe; Seishi Masaki, Kobe; Yukiyoshi Okada, Kobe, and Tadashi Yoshida, Kobe, all of Japan, assignors to: Obata, Do–Hi; Daiwa Fine Chemicals Co. Ltd.; Ishihaa Chemical Co., Ltd. i both of Kobe i Japan

Filed Sep. 10, 1984, Ser. No. 649,107
Int. Cl.⁴ C25D *3/56, 3/60*
U.S. Cl. 204—44.4 **6 Claims**

1. A tin-lead alloy plating bath based on a principal plating bath comprising an alkanesulfonic or alkanolsulfonic acid and both bivalent tin and lead salts thereof, characterized by the addition of a guanamine compound having the general formula



wherein R_1 and R_2, which may be the same or different, represent each a hydrogen atom, C_{1-18} straight- or branched-chain alkyl radical, C_{1-18} straight- or branched-chain alkoxy-lower alkyl radical, or a C_{3-7} cycloalkyl radical, or R_1 and R_2 may combine with the nitrogen atom to form a piperidine, morpholine or piperazine cycle, and A represents a lower alkylene radical.

4,555,315

HIGH SPEED COPPER ELECTROPLATING PROCESS AND BATH THEREFOR

Stephen C. Barbieri, Rutherford, and Linda J. Mayer, Denville, both of N.J., assignors to OMI International Corporation, Warren, Mich.

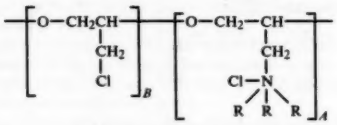
Filed May 29, 1984, Ser. No. 614,088
Int. Cl.⁴ C25D *3/38*
U.S. Cl. 204—52 R **10 Claims**

1. In an aqueous acidic electrolyte containing copper in an amount sufficient to electrodeposit copper on a substrate, the improvement comprising incorporating in the electrolyte a brightening and leveling amount of an additive system comprising a mixture of:

(a) a bath soluble polether compound,

(b) a bath soluble organic divalent sulfur compound,

(c) a bath soluble adduct of a tertiary alkyl amine with polyepichlorohydrin corresponding to the structural formula:



wherein:

R is the same or different and is methyl or ethyl,

A and B are integers whose sum is an integer of from 4 to about 500, and

A:B is at least about 1:5 and

(d) a bath soluble reaction product of polyethyleneimine and an alkylating agent which will alkylate the nitrogen on the polyethyleneimine to produce a quaternary nitrogen and wherein said alkylating agent is selected from the group consisting of benzyl chloride, allyl bromide, propane sultone, dimethyl sulfate and wherein the reaction temperature ranges from about room temperature to about 120° C.,

said additive system present to provide a mol ratio of (c):(d)

within a range of about 9:1 to about 1:10 and a mol ratio of (a)+(b):(c)+(d) within a range of about 35:1 to about 2:1, and being substantially free of compounds containing substituted phthalocyanine radicals.

4,555,316

SYNTHESIS OF POLY(SULPHUR NITRIDE)

Arthur J. Banister, Durham; Zdenek V. Hauptman, Bishop Auckland, and Aidan G. Kendrick, Stockport, all of England, assignors to National Research Development Corporation, London, England

Filed Aug. 6, 1984, Ser. No. 637,829

Claims priority, application United Kingdom, Aug. 23, 1983, 8322621

Int. Cl.⁴ C25C *3/00*

U.S. Cl. 204—59 R **15 Claims**

1. A method of synthesizing crystalline poly(sulphur nitride), comprising electrolyzing a solution of $(S_mN_n)_z^{p+}X_y^{q-}$ where: m is an integer; n is one of m and m−1; X is an anion; and p is the number of units of charge on the cation (S_mN_n); q is the number of units of charge on the anion X; y is the number of the anions, z is the number of the cations; and, to preserve electroneutrality, pz=qy, whereby poly(sulphur nitride) is electrodeposited.

4,555,317

CATHODE FOR THE ELECTROLYTIC PRODUCTION OF HYDROGEN AND ITS USE

Edgard Nicolas, Meise-Eversem, and Louis Merckaert, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Dec. 15, 1983, Ser. No. 561,726

Claims priority, application France, Dec. 17, 1982, 82 21390

Int. Cl.⁴ C25B *1/02, 11/06;* **C25D** *3/12*

U.S. Cl. 204—129 **10 Claims**

7. A process for the electrolytic produciton of hydrogen which comprises providing in an electrolytic cell containing an alkaline electrolyte, an anode and a cathode, said cathode having an active surface which comprises a nickel substrate, a porous coating film of dendrites of a metal selected from the group consisting of nickel and cobalt and a porous layer of an electrically conductive material interposed between said nickel substrate and said coating film of dendrites, said film of dendrites being formed in situ by electrolytic deposition on said cathode whilst said cathode is the seat of an electrolytic proton reduction in an aqueous electrolyte containing nickel ions or cobalt ions, and passing electric current between said anode and cathode to produce hydrogen gas at said cathode with minimum over-voltage.

4,555,318

REMOVAL OF FLUORIDE IMPURITIES FROM UF_6 GAS

James V. Beitz, Hinsdale, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 6, 1984, Ser. No. 568,769

Int. Cl.⁴ C01G *43/06*

U.S. Cl. 204—157.1 R **11 Claims**

1. A method of purifying a uranium hexafluoride gas stream containing a gaseous fluoride impurity of a transuranic metal, transition metal, or mixtures thereof, comprising the steps of contacting the gas stream with a bed of uranium pentafluoride at a temperature and time sufficient to react at least a portion of gaseous impurity with the uranium pentafluoride to form nongaseous product retained on the bed and thereby forming a treated gas stream, and removing the treated gas stream from contact with the bed.

4,555,319

RADIATION-CURABLE COMPOSITIONS COMPRISING ISOCYANURIC ACID-ACROLEIN DERIVATIVES

Saul M. Cohen, Springfield, and John R. LeBlanc, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 21, 1981, Ser. No. 332,641

Int. Cl.⁴ C08F *2/50, 2/54;* **C08G** *2/26, 2/02*

U.S. Cl. 204—159.21 **6 Claims**

1. A radiation-curable coating composition comprising about 50 to about 90 parts by weight of a polyunsaturated ester of an ethylenically unsaturated acid and a polyhydric alcohol, and about 10 to about 50 parts by weight of a polyaldehyde adduct formed from 1 mole of isocyanuric acid and from about 2 to about 3 moles of acrolein or a hemiacetal of the polyaldehyde adduct.

4,555,320

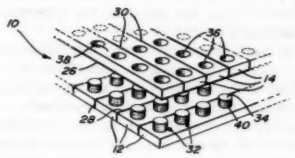
IMAGE REPRODUCTION BY IN PLANE ELECTRO-COAGULATION OF A COLLOID

Adrien Castegnier, Outremont, Canada, assignor to Elcorsy Inc., Saint-Laurent, Canada

Filed May 25, 1984, Ser. No. 614,020

Int. Cl.⁴ C25D *13/04, 13/06, 13/12, 13/18*

U.S. Cl. 204—180.9 **23 Claims**



1. A method of reproducing an image by electro-coagulation of an electrolytically coagulable colloid, which comprises the steps of:

(a) providing a plurality of negative and positive electrolytically inert electrodes electrically insulated from one another and arranged to define a matrix of dot-forming elements, the negative and positive electrodes of each matrix element having respective planar active surfaces with the negative electrode active surface extending in substantially the same plane as the positive electrode active surface and in close proximity thereto;

(b) applying a layer of a substantially liquid colloidal dispersion over the negative and positive electrode active surfaces of the matrix elements whereby the positive and negative electrode active surfaces are disposed on the same side of the layer of colloidal dispersion, said colloidal dispersion containing an electrolytically coagulable colloid, a liquid dispersing medium and a soluble electrolyte and having a substantially uniform temperature throughout said layer;

(c) generating an electrical field between the negative and positive electrodes of selected ones of said matrix elements, said electrical field extending substantially parallel to the planar active surfaces of the negative and positive electrodes, whereby to cause selective coagulation and adherence of the colloid onto the positive electrode active surfaces of said selected matrix elements, thereby forming a series of corresponding dots representative of a desired image; and

(d) removing any remaining non-coagulated colloid.

4,555,321

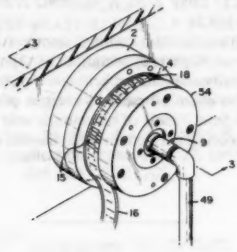
SELECTIVE PLATING APPARATUS

John L. Wicks, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 8, 1984, Ser. No. 618,707

Int. Cl.[4] C25D *5/02, 17/00*

U.S. Cl. 204—224 R **7 Claims**



1. An improved apparatus for plating interior surfaces of electrical terminals that are spaced apart and attached to a carrier strip comprising a strip feeding means for feeding the strip, a strip guide which guides the terminals through a plating zone while they are being plated, a source of electrolytic plating solution and a source of electrical potential for supplying an electrical current flow from an anode through the plating solution to a cathode, the strip guide being a mandrel that is continuously rotated as the strip of electrical terminals are continuously fed to the mandrel partially wrapped against the mandrel and fed from the mandrel, the improved apparatus being characterized in that

the anode has a plurality of anode extensions which are located around the mandrel's axis of rotation, said anode extensions being movable into and out of the interiors of the terminals that are against the mandrel,

the mandrel has a plurality of nozzles located around the mandrel's axis of rotation, said nozzles being associated with but separate from said anode extensions

a conduit is provided which carries plating solution under pressure through the nozzles and upon the anode extensions, whereby

the nozzles inject plating solution into the interiors of the terminals in which the anode extensions have been received, the electrical current flows from the anode extensions through the plating solution to the cathode, and the interior surfaces of the terminals are plated.

4,555,322

Patent Not Issued For This Number

4,555,323

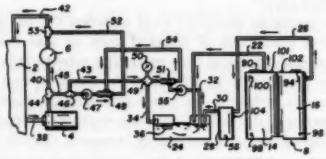
CHLORINATION DEVICE

Richard B. Collier, 957 Kolokolo Pl., Honolulu, Hi. 96825

Filed May 24, 1984, Ser. No. 614,107

Int. Cl.[4] C02F *1/46;* **C25B** *13/02*

U.S. Cl. 204—258 **7 Claims**



1. In a system to generate chlorine to disinfect a body of water, the system including a pump to move water through the system, a filter and an electrolytic cell able to generate chlorine by the electrolysis of sodium chloride and having an anode and a cathode, each mounted in a separate compartment with chlorine generation in the anode compartment and hydrogen generation in the cathode compartment, the compartments being in communication through an ion permeable membrane, a power source for the cell, the improvement comprising:

(a) the ion permeable membrane is formed as a plurality of separate members, each covering an opening in a wall dividing the anode and cathode compartments;

(b) the anode and the cathode are located by means positioned above the electrolyte; and

(c) a mixing container divided into a plurality of compartments, a first compartment to receive hydrogen and chlorine from the cell and provided with an outlet for water and the second compartment, in communication with the first and having an inlet for water, a float valve to control the inlet, the mixing container having a pressure relief outlet.

4,555,324

POROUS GAS DIFFUSION ELECTRODE AND METHOD OF PRODUCING THE SAME

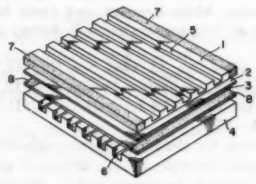
Mitsushi Ueno, Yokohama; Tamotsu Shirogami, Yamato, and Yukihiro Mikogami, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 7, 1984, Ser. No. 607,786

Claims priority, application Japan, May 9, 1983, 58-80553; Oct. 25, 1983, 58-198313

Int. Cl.[4] C25B *11/03, 11/04;* **B05D** *5/12;* **H01M** *2/08*

U.S. Cl. 204—284 **14 Claims**



1. A porous gas diffusion electrode constituted of an electroconductive porous substrate, which has itself on one surface reaction gas feed channels or is to be used with one surface in contact with reaction gas feed channels which comprises gas impermeable and electrically insulating seals formed from a material comprising a tetrafluoroethylene-perfluoroalkyl vinyl ether copolymer (PFA copolymer) and a substance wettable with respect to an electrolyte and thermally and chemically stable with respect to the electrolyte provided on the substrate at least at both end portions parallel to said reaction gas feed channels, wherein the substance wettable with respect to an electrolyte and thermally and chemically stable with respect to the electrolyte is used on the substrate at least at a hot pressure bonded portion formed from the PFA copolymer on the face opposite to the face having the reaction gas feed channels or the face opposite to the face to be contacted with the reaction gas feed channels during use.

4,555,325

METHOD FOR INTERCONNECTING THERMALLY AND PRESSURE-STRESSED MULTI-PHASE REACTORS

Eckard Wolowski, Mülheim, and Frank Mirtsch, Bottrop, both of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 626,183

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323885

Int. Cl.[4] C10G *1/00, 1/06;* **F28D** *21/00;* **B01J** *1/20*

U.S. Cl. 208—10 **4 Claims**

1. In a high pressure coal hydrogenation process in which multi-phase reaction products flow through at least one hydro-

genation reactor and are then cooled in a hot precipitator having a first output of a first phase comprising solids and condensed reaction products and a second output comprising a second phase of residual gas and vapors, said at least one reactor comprising an internal casing which forms a reaction chamber, and an external pressure casing in a spaced relation with the internal casing and defining therebetween a generally annular chamber, and said hot precipitator comprising an internal casing which forms a reaction chamber and an external pressure casing in a spaced relation with the internal casing and defining therebetween a generally annular chamber, an improvement for the pressure protection of the internal casings which form the reaction chambers in both said at least one reactor and said hot precipitator comprising the steps of establishing an interconnection between the annular chamber of each said at least one reactor, and the annular chamber of said hot precipitator and the second phase residual gas and vapor output of said hot precipitator via a manifold; and establishing pressure equilibrium between the annular chambers and the second phase of the residual gas and vapor output of said hot precipitator wherein processed conditioned pressure changes are simultaneously balanced between the interior casings which form the reaction chambers and the annular chamber surrounding the reaction chambers.

4,555,326

METHODS AND COMPOSITIONS FOR BORONIZING METALLIC SURFACES

Dwight K. Reid, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed May 17, 1984, Ser. No. 611,067
Int. Cl.[4] C10G *9/12*
U.S. Cl. 208—48 R **12 Claims**

1. In a method of inhibiting the formation and deposition of filamentous coke on the surface of metallic equipment used for the processing of a hydrocarbon at temperatures in the range of about 900° to 1300° F., where the undesired filamentous coke formation is commonly experienced, which method comprises processing said hydrocarbon in equipment which has been previously contacted with a liquid composition comprising a boron source selected from the group consisting of elemental boron, boron oxide compounds and metal borides suspended or dissolved in an organic liquid carrier containing an activator which permits and enhances the reaction between the metal of the metal surface and the boron to achieve the boronization thereof, said contact being for a time and at a temperature sufficient to provide a uniform boronized surface on the metallic surface which will come in contact with the hydrocarbon to be processed, said surface while being contacted with said composition being at a temperature of from about 1000°–1400° F.

4,555,327

CRACKING WITH TETRACHLOROALUMINATE CATALYSTS AND WATER

Mark A. Plummer, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 2, 1984, Ser. No. 627,154
Int. Cl.[4] C10G *11/08, 47/08*
U.S. Cl. 208—108 **19 Claims**

1. A process for producing lower molecular weight products from a higher molecular weight hydrocarbon liquid feedstock comprising:

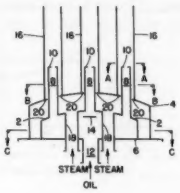
contacting the higher molecular weight hydrocarbon liquid feedstock with a molten catalyst system at a pressure from about atmospheric to about 14,200 kPa and a temperature from about 350° to 550° C. for a contact time sufficient to produce the lower molecular weight products wherein the molten catalyst system is comprised of a tetrachloroaluminate catalyst and water at a molar concentration from about 1 to about 25 percent and is substantially free of a metal chloride salt used in the manufacture of the tetrachloroaluminate catalyst.

4,555,328

METHOD AND APPARATUS FOR INJECTING LIQUID HYDROCARBON FEED AND STEAM INTO A CATALYTIC CRACKING ZONE

Frederick J. Krambeck, Cherry Hill; Stephen J. McGovern, Deptford, both of N.J., and John E. Sauer, Washington Crossing, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1984, Ser. No. 572,039
Int. Cl.[4] B01J *4/00, 8/18;* C10G *47/02, 35/14*
U.S. Cl. 208—157 **8 Claims**



1. A process of injecting a liquid hydrocarbon feedstock into a catalytic riser conversion zone which comprises:

(a) passing the liquid hydrocarbon feedstock, at a temperature effective to maintain said feedstock as a liquid at the pressure of said catalytic conversion zone, in parallel fashion through at least two confined passageways, each of said passageways having, at the downstream end thereof, a first flow restriction means effective to provide substantially the same flow rate of said feedstock through each of said confined passageways;

(b) passing a gaseous material in parallel fashion through at least two annular passageways, each of said annular passageways having a confined passageway extending longitudinally through a portion thereof in concentrically spaced relationship with respect to said confined passageway and each of said annular passageways having at the upstream end thereof a second flow restriction means in the form of an annular orifice effective to provide substantially the same flow rate of said gaseous material through each of said annular passageways;

(c) admixing said feedstock discharging from said first flow restriction means with said gaseous material, the relative linear velocity of said feedstock and said gaseous material being effective to atomize said feedstock to provide finely divided liquid droplets; and

(d) passing the admixture of step (c) into a catalytic conversion zone.

4,555,329

SELECTIVE FLOCCULATION OF COAL

Robert C. Sykes, Greenville, S.C.; Lawrence J. Connelly, Oak Lawn, and William J. Roe, Aurora, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 10, 1984, Ser. No. 679,728
Int. Cl.[4] B03D *3/06*
U.S. Cl. 209—5 **5 Claims**

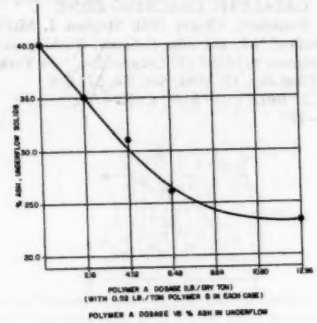
1. A method of separating gangue from coal in a coal refuse slurry which comprises the selective flocculation of a coal refuse slurry by:

a. adding thereto an effective amount of an anionic vinyl polymeric dispersant having a molecular weight ranging between about 2,000–250,000, thereby forming a dispersed coal refuse slurry, and then,

b. adding thereto an effective amount of an anionic vinyl polymeric flocculant having a molecular weight ranging between about 1,000,000 and about 50,000,000, thereby forming a flocculating coal slurry.

c. allowing the flocculating coal slurry to settle without vigorous agitation, thereby forming a concentrated, settled coal slurry and a dispersed gangue slurry, and then

d. collecting the concentrated, settled coal slurry and removing water and dissolved salts therefrom to obtain a low-ash coal particulate, while separating



e. treating said dispersed gangue with a cationic flocculant or coagulant to form a flocculated and settled inorganic gangue and a recyclable aqueous phase, and finally

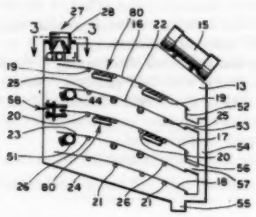
f. collecting the flocculated inorganic gangue and recycling the aqueous phase.

4,555,330

METHOD AND APPARATUS FOR SEPARATING MATERIAL

Masataka Tsutsumi, Canton, and Richard J. Frohman, Massillon, both of Ohio, assignors to Midwestern Industries, Inc., Massillon, Ohio

Filed Aug. 29, 1983, Ser. No. 526,951
Int. Cl.⁴ B07B *1/28*
U.S. Cl. 209—254 **13 Claims**



1. Apparatus for separating materials by size comprising:

frame means;

means to vibrate the apparatus to facilitate separating the materials, said means generating a vibratory throw;

a plurality of screen assemblies secured to said frame means and vertically arranged relative to each other;

a basin supported by said frame means;

a conically shaped flow diverter positioned within said basin and adapted to receive the material to be separated;

divider means extending upwardly within said basin and dividing said basin into approximately equal parts, said divider means engaging said flow diverter circumferentially and extending transversely therefrom, said flow diverter being partially recessed within said divider means, said divider means further being oriented within said basin so as to compensate for said vibratory throw of said means to vibrate whereby the material to be separated is transmitted approximately equally to said parts of said basin;

means to feed the material within each of said equal parts to a different of said screen assemblies uniformly across one dimension of said screen assemblies so that the material may be separated by size; and

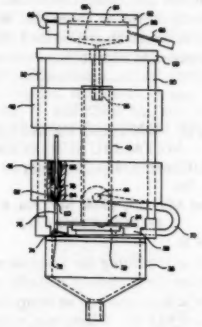
means to transmit the material within at least some of said equal parts to said means to feed.

4,555,331

SELF-METERING SEMI-AUTOMATIC QUANTITATIVE FILTRATION ASSEMBLY

Michael G. Thornton, and Benton C. Clark, III, both of Littleton, Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation of Ser. No. 556,029, Nov. 29, 1983, abandoned. This application Jan. 30, 1985, Ser. No. 696,863
Int. Cl.⁴ G01N *15/04*
U.S. Cl. 210—99 **34 Claims**



1. A filtering apparatus comprising:

means for supporting a filter medium,

measuring means to measure and to present a known quantity of fluid to a filter medium,

means to apply a vacuum to draw said known quantity of fluid through a filter medium,

said means to apply a vacuum including waste means to receive fluid drawn through a filter medium,

a fluid holding means adjacent and below a filter medium having means (i) for receiving and holding fluid in excess of said known quantity, which excess fluid does not pass through a filter medium and (ii) for receiving at least a portion of said known quantity of fluid positioned above a filter medium in said measuring means, which said portion of known quantity of fluid cannot pass through a filter medium,

said means for receiving comprising an inlet into said fluid holding means spaced laterally from a filter medium, and

outlet means in said fluid holding means for draining said fluid holding means into said waste means.

4,555,332

TREATMENT OF OIL WELL PRODUCTION

Alex W. Francis, Jr., Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 27, 1984, Ser. No. 574,312
Int. Cl.⁴ B01D *3/00*
U.S. Cl. 210—104 **5 Claims**

1. A system for stratifying liquids of oil well production containing a difficult-to-treat component of emulsion, including,

a cylindrical vessel vertically extended,

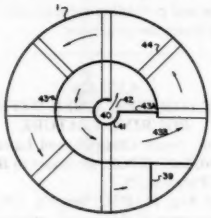
an inlet conduit mounted through the top of the vessel at its axis,

a cylindrical chamber formed coaxially with the vessel by a first baffle vertically extended within the vessel and connected to the inlet conduit to receive oil well production liquids,

an opening in the side of the chamber through which the production liquids flow into a first path segment formed by a second baffle vertically extended and concentric with the first baffle of the chamber,

a second path segment formed between the second baffle and the wall of the vessel and connected to and concentric with the first path segment whereby both flow path segments form a flat spiral to utilize the entire volume of the vessel to flow the production liquids,

a plurality of coalescing sections providing impact surfaces and spaced at predetermined distances along the length of the path which stratify the produced liquids into an upper



oil layer and a lower water layer and an intermediate layer continuing a major portion of difficult-to-treat emulsion,

a separate outlet conduit mounted through the vessel wall for each stratified layer at a second end of the flow path through which the liquid of each layer is separately withdrawn,

a first means mounted through the vessel wall at a predetermined height to sense the upper interface between the oil layer and the layer containing the difficult-to-treat emulsion,

a second means mounted through the vessel wall a predetermined vertical distance below the first sensing means with which to sense the interface between the water layer and the layer containing the difficult-to-treat emulsion, and

flow control means mounted in the outlet conduits connected to the first and second sensing means to control the rates of withdrawal from the two lower stratified layers which will maintain the height of the two interfaces at predetermined vertical distances.

4,555,333

SELF-PURGING SEPARATOR

Claude C. Laval, Jr., 2444 N. Farris Ave., Fresno, Calif. 93704

Filed Feb. 9, 1984, Ser. No. 578,779

Int. Cl.⁴ B04C *5/15*

U.S. Cl. 210—113 **1 Claim**

1. A self-purging separator for disposing of particulate matter borne by a liquid medium found in water wells and the like while submerged therein by segregating and accumulating such particulate matter and subsequently releasing accumulated particulate matter for gravitational descent down the well, the separator comprising:

A. a substantially cylindrical housing adapted to be submerged in a substantially erect attitude in said liquid medium containing particulate matter in a well and enclosing an elongated chamber having opposite upper and lower portions spaced from each other;

B. a substantially cylindrical vortex finder mounted on the housing in communication with the upper portion of the chamber disposed substantially centrally thereof and adapted to be connected in liquid transferring relation to a pump whereby such pump is operable to draw liquid from the chamber through the vortex finder;

C. means for admitting the liquid medium containing said particulate matter in which said housing is submerged to the upper portion of the chamber along a path substantially tangential to a circle concentric to the housing to fill the chamber and, when said pump is not operating, creating a substantial balance of liquid pressures within the chamber and outside the housing and whereby during operation of said pump the liquid medium containing said particulate matter enters the chamber through the admitting means, swirls downwardly and inwardly therein centrifuging the particulate matter outwardly thereof for descent in the chamber and the liquid medium from which the particulate matter has been removed thence swirls upwardly and out of the chamber through the vortex finder; and

D. a valve assembly mounted on the housing in communication with the lower portion of the chamber including a downwardly disposed annular valve seat mounted on the housing and defining a passage therethrough, and a flexible valve member, having a downwardly disposed surface and an upwardly disposed surface, mounted in communication with the lower portion of the chamber beneath the valve seat and flexibly positionable upwardly against the valve seat about the periphery of the passage in substantially sealing relation to the passage when the pressure on the downwardly disposed surface exceeds the pressure on the upwardly disposed surface to accumulate the particulate matter thereon and flexibly positionable downwardly from the valve seat to open the passage downwardly sufficiently to discharge particulate matter from the separator down the well when the pressure on the upwardly disposed surface exceeds the pressure on the downwardly disposed surface.

4,555,334

METHOD AND APPARATUS FOR CLEANING A PURGIBLE SWIMMING POOL STRAINER

Joseph D. Cohen, Frisco, Tex., assignor to Performance Pool Products, Ltd., Frisco, Tex.

Continuation-in-part of Ser. No. 477,378, Mar. 21, 1983. This application Jul. 22, 1983, Ser. No. 516,456

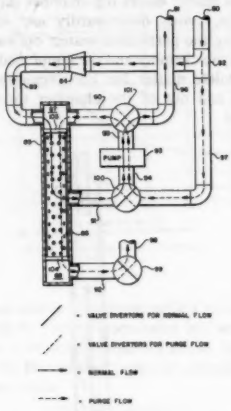
Int. Cl.⁴ B01D *29/38*

U.S. Cl. 210—169 **9 Claims**

1. An apparatus for circulating water in a swimming pool comprising:

a strainer connected through a valve means to a swimming

pool intake for retaining particles from a flow of water from the swimming pool intake;
a pump connected through the valve means to the strainer for pumping water;
a filter for removing sediment from water received from the pump through the valve means;
a swimming pool return connected to the filter for depositing water from the filter into the swimming pool; and
the valve means for interconnecting said strainer, said pump,



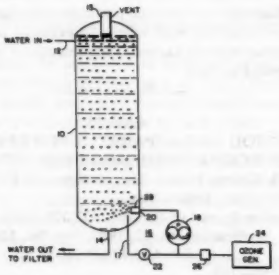
said filter, said swimming pool intake and said swimming pool return and for providing a first direction of water flow from the swimming pool intake through the strainer to the pump and to the filter and alternately providing a second direction of water flow from the swimming pool intake to the pump to the strainer to provide water flow substantially only across a single side of the strainer to remove particles retained thereon and to a waste receptacle wherein said water flow with removed particles are deposited.

4,555,335

OZONATOR FEED SYSTEM

W. Alan Burris, 7 E. Jefferson Cir., Pittsford, N.Y. 14534

Continuation of Ser. No. 912,870, Jun. 5, 1978, abandoned, which is a continuation of Ser. No. 569,765, Apr. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 403,792, Oct. 5, 1973, abandoned. This application Mar. 23, 1982, Ser. No. 361,476
Int. Cl.⁴ C02F *1/78*
U.S. Cl. 210—192 **3 Claims**



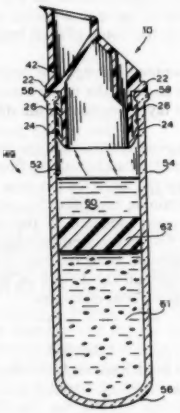
1. Apparatus for treating water with ozone comprising:
a. a tank for storing water at normal line pressure, said tank having an inlet near its top, an outlet near its bottom, and an auxiliary inlet near its bottom,
b. a by-pass circuit connected between the outlet of said tank and the auxiliary inlet,
c. a pump connected in said by-pass circuit for pumping water from the outlet of said tank back into said tank through said auxiliary inlet, said pump being of the positive displacement type and capable of pumping large quantities of gas entrained in the water without becoming airbound,
d. means for restricting the flow of water from said tank to said pump enough so that in operation the pump develops a suction at its inlet;
e. an ozone generator, and
f. means connecting the outlet of said ozone generator to the inlet of said pump so that in operation suction developed by the pump at its inlet draws gas from said generator into siad pump, said pump being the sole source of suction in the apparatus and providing substantially the only impetus drawing gas from the generator.

4,555,336

POUR SPOUT FOR CONTAINER WITH IMPROVED POURING FEATURE

Edward L. Nugent, North Caldwell, and Lawrence Lutkowski, East Rutherford, both of N.J., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Aug. 11, 1980, Ser. No. 176,932
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.⁴ B01D *35/02*
U.S. Cl. 210—232 **17 Claims**



14. A container assembly which comprises:
a container having a side wall and enclosed by an end wall and formed with an opening at the other end thereof; and
a pouring spout disposed within the opening in said container, said pouring spout being comprised of a cylindrically shaped body side wall, a spout member, a screen means and a vent means, said cylindrically shaped body side wall enclosed at one end by a top wall and defining a first fluid channel, said spout member extending outwardly from said top wall and defining a second fluid channel having a fluid outlet orifice, said fluid channels being in fluid communication with each other and defining a fluid passageway for said liquid, said screen means angularly disposed in said fluid passageway for removal of solids from said liquid, said vent means providing for

pressure equalization between said passageway and ambient atmosphere.

4,555,337

PLUG AND FILTER ASSEMBLY FOR PAINT SPRAYER

Eugene F. Gargas, Wooster, Ohio, assignor to The Wooster Brush Company, Wooster, Ohio

Filed Oct. 23, 1984, Ser. No. 663,868
Int. Cl.[4] B01D *29/10*
U.S. Cl. 210—238 **21 Claims**

1. A plug and filter assembly removably securable in a paint head or the like having a filter chamber and a bore for insertion and removal of the assembly, said assembly comprising:

a sealing plug axially insertable into the paint head bore for sealing by an annular element to the inside of the paint head bore;

a cylindrical filter insertable into the paint head filter chamber;

means securing said filter coaxially to the inner end of said sealing plug;

a knob having a threaded portion for threaded engagement with a correspondingly threaded portion of the paint head and a head portion for turning of said knob; and

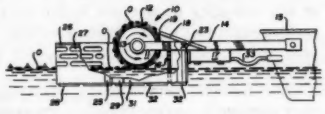
fastener means rotatably coupling said sealing plug and knob for axially driving of said sealing plug without rotation into and out of engagement with the sealing element upon turning of said knob when in threaded engagement with the paint head.

4,555,338

OIL SPILL COLLECTOR

Tony Marchionda, 708 Fifth St., Struthers, Ohio 44471

Filed Oct. 9, 1984, Ser. No. 658,999
Int. Cl.[4] B01D *17/02*
U.S. Cl. 210—242.4 **7 Claims**



1. Apparatus for removing oil from the surface of a body of water comprising:

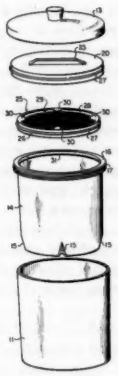
spaced mounting means at least partially above the body of water, a cylindrical roller journaled for rotation between said mounting means, said cylindrical roller having a porous deformable surface material partially submerged in the body of water, a breakwater extending from said spaced mounting means at least partially above said body of water and enclosing an area extending outwardly from said cylindrical roller, a collector blade adjacent said cylindrical roller for removing and collecting oil adhering to said absorbent material, means for rotating said cylindrical roller so that said absorbent material contacts the oil and moves the same beneath the water's surface and inunder said cylindrical roller and means for reversing said rotation of said cylindrical roller and engaging said collector blade on said absorbent material.

4,555,339

COOKING GREASE COLLECTION POT

James E. Graves, and Joan M. K. Graves, both of 312 Donax Ave., Imperial Beach, Calif. 92032

Filed Dec. 2, 1983, Ser. No. 557,617
Int. Cl.[4] B01D *35/00, 35/28*
U.S. Cl. 210—244 **7 Claims**



1. A cooking grease collection pot comprising:

an outer upwardly opening container;

an inner upwardly opening container conformably shaped and dimensioned to be received within the outer container, the inner container being made of a material with sufficient heat resistance to prevent substantial deformation when directly contacted by grease which has been heated to cooking temperatures;

a lid for closing the opening of the inner container; and

means for preventing relative rotation between the containers when the inner container is received within the outer container;

wherein the outer container and the inner container are cylindrical, the outside diameter of the inner container is slightly smaller than the inside diameter of the outer container, and the rotation preventing means includes a plurality of circumferentially spaced, radially inwardly extending projections formed on an interior wall of the outer container, and a plurality of circumferentially spaced, radially inwardly extending notches formed on an exterior wall of the inner container each for receiving a corresponding projection when the inner container is inserted into the outer container.

4. A pot according to claim 1 further comprising a removable strainer including an annular ring and a layer of screen material attached to and covering the area enclosed by the ring, the ring having an annular rib formed on an exterior wall thereof and an outer diameter slightly smaller than the inner diameter of the upper end of the inner container so that the ring can be removably inserted into the upper end of the inner

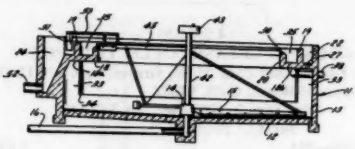
container with the annular rib snapping into an annular groove formed in the upper end of the interior container.

4,555,340

EXCESS OVERFLOW ORIFICE TUBES

William H. Boyle, Milwaukee, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Oct. 26, 1983, Ser. No. 545,561
Int. Cl.⁴ B01D *21/24*
U.S. Cl. 210—248 **6 Claims**



1. In a sedimentation tank having a peripheral feed channel through which liquid can flow at varying elevations and with corresponding variations in hydraulic force; said channel provided with a floor and means defining a series of first stage orifices consisting of lower ports through which liquid can gradually flow from said feed channel into the tank without disturbing the sedimentation process, and an effluent weir which maintains the level of liquid in the tank within specified limits; wherein the improvement comprises:

means for maintaining the hydraulic force of said incoming liquid within predetermined limits, comprising;

means defining a plurality of second stage orifices extending through a side wall of said channel at an elevation at or above the floor of said channel between a normal liquid elevation and a predetermined maximum liquid elevation limit;

means defining a plurality of hollow overflow conduits in said side wall of said channel which correspond to and adjoin said second stage orifices to permit the passage of water from the channel into said tank without otherwise physically obstructing the flow of liquid in said channel or creating a turbulence in said tank; and

said overflow conduits including a scum baffle and weir for allowing liquid to flow under the baffle and over the weir while preventing floating material from passing into said tank.

4,555,341

POUR SPOUT FOR A CONTAINER WITH IMPROVED SCREENING FEATURE

Edward L. Nugent, North Caldwell, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

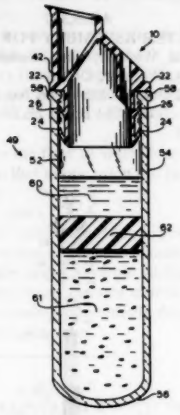
Filed Aug. 11, 1980, Ser. No. 176,931
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.⁴ B01D *35/02*
U.S. Cl. 210—359 **5 Claims**

1. A pouring spout for use with a container for the withdrawal of a liquid from the container under conditions of controlled flow comprising:

a body side wall enclosed at one end by a top wall and defining a first fluid channel;

a spout member extending outwardly from said top wall and defining a second fluid channel having a fluid outlet orifice, said channels being in fluid communication with each other and defining a fluid passageway for said liquid;

screen means including diverging grate members defining increasing open areas at increasing pouring angles disposed in said fluid passageway for removal of solids from said liquid; and



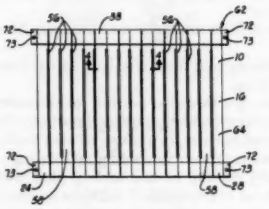
vent means for providing pressure equalization between said passageway and ambient atmosphere.

4,555,342

RIBBON FILTER APPARATUS

Blake F. Grant, Rte. 1, Box 264A, Hagerman, Id. 83332

Continuation-in-part of Ser. No. 393,183, Jun. 28, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 598,172
Int. Cl.⁴ B01D *25/04*
U.S. Cl. 210—488 **16 Claims**



1. A filter comprising:

a housing having an interior surface and an exterior surface;

at least one filtration module supported within the housing, comprising:

a first flexible sheet, comprising:

a first edge section;

an opposed second edge section; and

an interior section intermediate to the first and second edge sections, the interior section having a plurality of slits extending transversely to the edge sections, each adjacent pair of slits defining a ribbon element, each ribbon element disposed in a fully extended, flexible state;

a first lower terminal element having a corrugated first surface disposed in surface-to-surface engagement with each portion of the first edge section of the first flexible sheet; and

a first upper terminal element having a corrugated first surface disposed in surface-to-surface engagement with each portion of the second edge section of the first flexible sheet.

4,555,343

PROCESS OF LIQUID-LIQUID EXTRACTION OF METALS, WITH THE AID OF A MICROEMULSION, FROM AN AQUEOUS SOLUTION

Denise Bauer, Le Raincy; Jacques Komornicki, Lescar, and Jacques Tellier, Billere, all of France, assignors to Societe Nationale Elf Aquitaine, France

Filed Feb. 24, 1983, Ser. No. 469,241
Claims priority, application France, Feb. 26, 1982, 82 03231
Int. Cl.[4] B01D *11/04*
U.S. Cl. 210—643 14 Claims

1. A process for the extraction of metal ions from an aqueous solution thereof which comprises:

mixing (a) an aqueous solution containing the metal ions and having a pH of 0.5 to 8, (b) a hydrophobic liquid containing an extractant for the metal ions, (c) an anionic or nonionic surfactant and (d) an alcohol co-surfactant, in a proportion such that the hydrophobic liquid forms a microemulsion with a portion of the aqueous solution;

allowing the mixture to separate into an aqueous layer and a microemulsion layer;

separating the aqueous layer from the microemulsion layer;

breaking the microemulsion; and

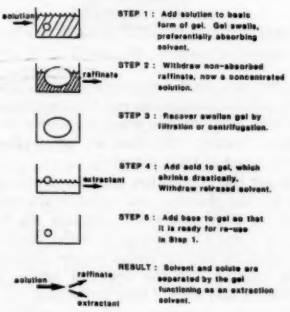
recovering the aqueous phase of the broken microemulsion.

4,555,344

METHOD OF SIZE-SELECTIVE EXTRACTION FROM SOLUTIONS

Edward L. Cussler, Edina, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Aug. 25, 1983, Ser. No. 526,275
Int. Cl.[4] B01D *15/06, 15/08*
U.S. Cl. 210—670 10 Claims


solution
STEP 1 : Add solution to basic form of gel. Gel swells, preferentially absorbing solvent.
raffinate
STEP 2 : Withdraw non-absorbed raffinate, now a concentrated solution.
STEP 3 : Recover swollen gel by filtration or centrifugation.
extractant
STEP 4 : Add acid to gel, which shrinks drastically. Withdraw released solvent.
STEP 5 : Add base to gel so that it is ready for re-use in Step 1.
RESULT : Solvent and solute are separated by the gel functioning as an extraction solvent.
solution
raffinate
extractant

1. A method of selectively extracting low molecular weight solvents from solutions of higher molecular weight solutes which comprises:

(A) admixing a solution of a high molecular weight solute in a low molecular weight solvent with either a cross-linked partially hydrolyzed ionic polymer gel or an ionic dextran gel, both gels capable of undergoing a rapid change in volume in response to change in pH,

(B) extracting a portion of the solvent from the solution by rapid swelling of the gel by selective absorption of the solvent under preselected pH conditions, thereby concentrating the solution,

(C) after absorption of a portion of the solvent by the gel, separating the concentrated solution from the swollen gel,

(D) after separation of the concentrated solution from the swollen gel, subjecting the gel to a change in pH whereby the gel shrinks to a reduced volume to release most of the absorbed solvent, and

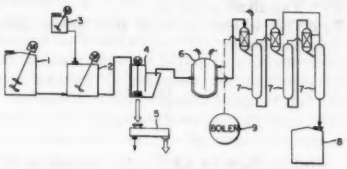
(E) separating the solvent from the reduced volume gel.

4,555,345

METHOD OF TREATMENT FOR SEPARATION OF OIL FROM OIL-CONTAINING SLURRY WASTE

Tadayuki Yoshida, Fukuoka, Japan, assignor to Sankyo Yuki Kabushiki Kaisha, Fukuoka and Arai Shoji Kabushiki Kaisha, Hiratuka, both of, Japan

Continuation of Ser. No. 596,576, Apr. 5, 1984, abandoned, which is a continuation of Ser. No. 336,320, Dec. 31, 1981, abandoned. This application Mar. 11, 1985, Ser. No. 709,365
Claims priority, application Japan, Jan. 22, 1981, 56-7140; Jun. 19, 1981, 56-93942
Int. Cl.[4] C02F *1/24, 1/52*
U.S. Cl. 210—705 17 Claims



1. In the treatment of an oil-containing waste slurry containing sewage sludge, human or animal excrement, household waste, or industrial organic effluents from food processing or wool scouring plants, or mixtures of these materials, a method for separating an oil component from said oil-containing waste slurry comprising the steps of:

adding a saponifying agent to the waste slurry to saponify part of the oil or fat contained therein;

stirring the waste slurry containing the thus-formed soap to effect foaming of the waste slurry, whereby the remaining oil component adheres to the foam and rises to the surface of the waste slurry due to buoyancy; and

separating the foam to which the oil component adheres from said waste slurry so that said waste slurry is converted to a slurry with a low oil content, wherein said separated foam to which the oil component adheres is in the form of a water-containing oil component, wherein said saponifying agent is selected from the group consisting of potassium hydroxide and sodium hydroxide in an amount of 1/100 to 1/30 parts by weight based on the amount of the organic substances present in the waste slurry.

4,555,346

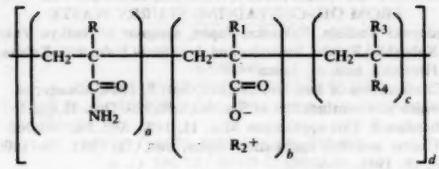
PROCESS FOR FLOCCULATING PHOPHATIC SLIMES

Meyer R. Rosen, Spring Valley, N.Y.; You-Ling Fan, East Brunswick, N.J., and Nan S. Chu, Hartsdale, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 302,141, Sep. 14, 1981, abandoned. This application Sep. 17, 1984, Ser. No. 651,338
Int. Cl.[4] B01D *21/01*
U.S. Cl. 210—734 10 Claims

1. A process for flocculating phosphatic slimes which comprises:

(a) forming a concentrated aqueous solution from a water-soluble, ter- or higher polymer water-in-oil emulsion, wherein said polymer has the formula containing the repeating units as follows:



wherein:

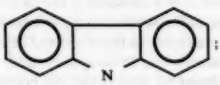
R, R_1 and R_3 are independently hydrogen or methyl;

R_2^+ is an alkali metal ion;

R_4 is OR_5 wherein R_5 is an alkyl group having up to 5 carbon atoms;

wherein R_6 is an alkyl group having up to 8 carbon atoms;

wherein R_7 is methyl, ethyl or butyl; phenyl; substituted phenyl; CN or



a is from about 30 to about 90 mole percent;

b is from about 5 to about 60 mole percent;

c is from about 1 to about 10 mole percent;

d is an integer of from about 1,000 to about 500,000;

and wherein said polymer has an intrinsic viscosity from about 15 to about 28 dl/g as measured in a one normal aqueous sodium chloride solution;

(b) diluting said concentrated aqueous solution of ter- or higher polymer formed in step (a) with additional water;

(c) mixing the diluted solution of step (b) with phosphatic slimes under floc forming conditions; and

(d) allowing the suspended solids to settle from said slime to form an essentially clear aqueous supernatant.

4,555,347

IODINE DISINFECTION DISPENSER

Dennis H. O'Dowd, 4070 Old Dundas St. W., Toronto, Ontario M6S 2R6, and George W. J. Barry, 2063 Lakeshore Blvd. W., Toronto, Ontario M8V 1A1, both of Canada

Continuation-in-part of Ser. No. 441,909, Nov. 15, 1982, abandoned. This application Apr. 20, 1984, Ser. No. 602,353

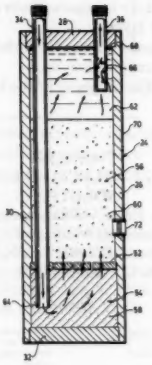
Int. Cl.[4] C02F *1/50*

U.S. Cl. 210—752 **21 Claims**

1. A method of providing a disinfectant carried by a supply of water flowing through a conduit, comprising introducing a predetermined portion of the water into a sealed container having a reservoir and a chamber below the reservoir in intercommunication therewith, the chamber containing a bed of filter material, the reservoir holding a quantity of iodine crystals lying in a bed in the bottom portion of the reservoir and being of a predetermined size sufficient to hold a quantity of water proportional to the maximum flow rate attainable through the conduit and such that a minimum concentration of 120 parts per million (milligrams per liter) is obtainable as an outflow from the container when the supply of water is at least above freezing, the predetermined portion of the water being introduced into the chamber and through a first tube having an outlet portion opening into the chamber and outflowing from the reservoir through a second tube opening into the reservoir above the iodine crystals said second tube projecting into the reservoir and closed at the end thereof, and carrying a plurality of slots adjacent the closed end of the passage of water, the slots being of a size to prevent the passage of crystalline iodine therethrough whereby all said water portion passes through the filter material and between the iodine crystals.

9. A device for providing a disinfectant carried by a supply of water flowing through a conduit, comprising:

a sealed container having a reservoir and a chamber below the reservoir in intercommunication therewith, the reservoir holding a quantity of iodine crystals lying in a bed in the bottom portion of the reservoir and being of a predetermined size sufficient to hold a quantity of water proportional to the maximum flow rate attainable through the



conduit and such that a maximum concentration of 120 parts per million (milligrams per liter) is obtainable as an outflow from the container when the supply of water is at least above freezing, the chamber below the reservoir containing a bed of filter material;

inlet means for the connection with the water supply and opening into the chamber, and outlet means opening from the reservoir above the iodine crystals, the inlet means comprising a first tube having an outlet portion opening into the chamber and the outlet means comprising a second tube opening into the reservoir above the bed of iodine crystals said second tube projecting into the reservoir and closed at the end thereof, and carrying a plurality of slots adjacent the closed end for the passage of water, the slots being of a size to prevent the passage of crystalline iodine therethrough, whereby all said water portion throught the filter material and between the iodine crystals.

4,555,348

LIQUID BUFFER SYSTEM

James C. Moran, Taylors, S.C., assignor to Sybron Chemicals Inc., Birmingham, N.J.

Filed Jun. 28, 1984, Ser. No. 625,755

Int. Cl.[4] C09K *3/00*; D06P *1/00*

U.S. Cl. 252—1 **5 Claims**

1. A premixed low pH liquid buffer suitable for use as a direct textile bath additive which consists essentially of a water solution in the following percent by weight:

Monosodium Phosphate: 13–40

Phosphoric Acid: 5–30

Water: Balance

2. A premixed high pH liquid buffer suitable for use as a

direct textile bath additive which consists essentially of a water solution in the following percent by weight:

Tripotassium Phosphate: 20–50
Potassium Hydroxide: 2.5–20
Water: Balance

4,555,349

FABRIC SOFTENING COMPOSITIONS

Robert M. Butterworth, and Martin A. Wells, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,584

Claims priority, application United Kingdom, Apr. 8, 1983, 8309664

Int. Cl.⁴ C11D *1/62, 3/20*

U.S. Cl. 252—8.6 **6 Claims**

1. A concentrated liquid fabric softening composition comprising:

(i) an aqueous base;

(ii) at least 8% by weight of a water-insoluble cationic fabric softening agent;

(iii) a nonionic material having a HLB of not more than 10, selected from C_8–C_{24} fatty acids, the weight ratio of the cationic fabric softening agent to the fatty acid being not more than 4.6:1; and

(iv) from 10 ppm to 3,000 ppm of an electrolyte wherein said electrolyte is a salt of alumimium.

4,555,350

CARBAMATES OF BETA-HYDROXYETHYLSULFOXIDES

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company, Chicago, Ill.

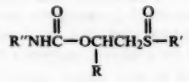
Division of Ser. No. 408,763, Aug. 17, 1982, Pat. No. 4,511,730. This application Aug. 20, 1984, Ser. No. 642,552

Int. Cl.⁴ E21B *43/22*

U.S. Cl. 252—8.55 D **3 Claims**

1. A method of injecting a micellar slug into a subterranean formation to enhance oil recovery comprising the steps of:

(1) contacting said formation with an aqueous fluid composition comprising water, a surfactant, a hydrocarbon, an electrolyte and a co-surfactant comprising a carbamate of a beta-hydroxyethylsulfoxide of molecular weight of from about 400 to about 1000, wherein the said carbamate is of the forumla



wherein R, R′ and R″ are individually selected from the group consisting of radicals derived from benzene, biphenyl, naphthalene, anthracene, and phenanthrene; alkyl moieties of 1 to 22 carbon atoms, and aralkyl moieties, alkylated aryl moieties, and cycloalkyl moieties containing 4 to 40 carbon atoms, the ring radicals of said moieties being selected from the group consisting of phenyl, biphenyl and cyclohexyl radicals, wherein R′ can be substituted with nitro, halogen, cyano and carboalkoxy moieties of 1 to 12 carbon atoms,

(2) applying sufficient pressure to said composition to cause said micellar slug to move through said formation,

(3) maintaining sufficient pressure while injecting said composition into said formation,

(4) and recovering oil from said formation.

4,555,351

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Funabashi; Junichi Yamada, and Toshiyuki Ukigai, both of Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 458,360, Jan. 17, 1983, Pat. No. 4,532,053. This application Mar. 31, 1983, Ser. No. 480,770

Claims priority, application Japan, Jan. 28, 1982, 57-10858

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.⁴ E21B *43/22*

U.S. Cl. 252—8.55 D **6 Claims**

1. A micellar slug for use in the recovery of oil, said slug consisting essentially of a hydrocarbon, an aqueous medium containing about 2% to 15% inorganic salt, a surfactant and a consurfactant said surfactant containing, as an essential component, an internal olefin sulfonate having 10 to 26 carbon atoms the difference between the maximum and minimum carbon numbers of the internal olefin sulfonates being not more than 5 and the content of the same carbon number component of the internal olefin sulfonates present in the largest amount in the internal olefin sulfonates being 80% by weight or more.

4,555,352

LUBRICANT ADDITIVE

Alfred V. Garner, and William W. Nalder, both of Raymond, Canada, assignors to Power-Aid Industries (1980) Ltd., Raymond, Canada

Continuation-in-part of Ser. No. 483,288, Apr. 8, 1983, abandoned. This application Jul. 13, 1984, Ser. No. 630,683

Int. Cl.⁴ C10M *1/54*

U.S. Cl. 252—35 **43 Claims**

1. A heavy duty lubricant additive composition comprising:

(1) from about 5% to about 45% by weight of a lead soap of an organic acid, said lead soap being in the form of a solution in a liquid organic solvent therefor, said solution containing from 10%–32% by weight lead;

(2) 20%–50% by weight of an oil having a viscosity in the range of from about 45 SUS at 100° F. to about 3000 SUS at 100° F.; and

(3) 5%–40% by weight of diesel oil, or of a hydrocarbon oil having physical characteristics comparable to said diesel oil; said composition functioning both as a friction-reducing agent and as an extreme pressure (EP) additive.

4,555,353

BORATED PHOSPHONATES AS LUBRICANT AND FUEL ADDITIVES

Andrew G. Horodysky, Cherry Hill, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 535,131, Sep. 23, 1983, Pat. No. 4,522,629. This application Mar. 13, 1985, Ser. No. 695,607

Int. Cl.⁴ C10M *1/10*

U.S. Cl. 252—49.6 **19 Claims**

1. A lubricant composition comprising a major proportion of a lubricant and from about 0.1 to about 10% by weight of the total composition of a reaction product made by reacting a hydrocarbyl vicinal diol containing 10 to 30 carbon atoms, a dihydrocarbyl phosphite of the formula

wherein R^1 is a hydrocarbyl group containing 1 to 30 carbon atoms and R^2 is a hydrocarbyl group containing 1 to 6 carbon atoms and a boron compound, the reaction being run at from about 70° C. to about 260° C. using amounts of reactants such

that in the final product at least about 5% of the hydroxy groups originally available are borated.

4,555,354

DETERGENTS PRODUCTS

David E. Clarke; James F. Davies; Colin Smart, and John B. Tune, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 536,137, Sep. 26, 1983, abandoned, which is a continuation of Ser. No. 383,648, Jun. 1, 1982, abandoned, which is a continuation of Ser.No. 198,013, filed as PCT GB 79/00189, Nov. 16, 1979, published as WO 80/01076, May 29, 1980 § 102(e) Jul. 14, 1980, abandoned.
This application Aug. 31, 1984, Ser. No. 645,898
Claims priority, application United Kingdom, Nov. 17, 1978, 45105/78
Int. Cl.[4] C11D *17/04*
U.S. Cl. 252—90 2 Claims

1. In a detergent product in the form of a particular detergent composition suitable for treating fabrics in a washing machine, contained within a closed water-insoluble bag adapted to open in a washing machine environment, the improvement which comprises forming said bag at least partially of thermoplastic material and closing said bag with a mechanically weak heat seal including a layer of water-insoluble non-heat-sealable material positioned between the heat sealed surfaces to provide weakening of said heat seal, whereby under the influence of mechanical action during a wash cycle in a washing machine said mechanically weak heat seal opens and the contents of said bag are discharged.

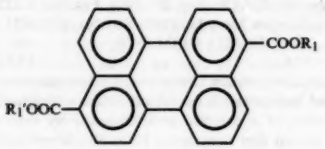
4,555,355

COMPOSITION FOR LIQUID CRYSTAL COLOR DISPLAY

Yasuyuki Yamada; Tadaaki Tanaka, both of Ohmuta; Ryoichi Tukahara, Mobara, and Tsutomu Nishizawa, Ohmuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 385,400, filed as PCT JP 81/00258, Sep. 30, 1981, published as WO 82/01191, Apr. 15, 1982 § 102(e) date May 21, 1982, Pat. No. 4,459,218.
This application Nov. 22, 1983, Ser. No. 552,302
Claims priority, application Japan, Oct. 3, 1980, 55-137779
Int. Cl.[4] C09K *3/34;* G02F *1/13*
U.S. Cl. 252—299.1 7 Claims

1. A composition for liquid crystal color display, said composition comprising at least one nematic liquid crystal and at least one perylenedicarboxylic acid ester dye represented by the following formula (II):



(II)

wherein R_1' and R_1 are identical or different, and each represents a cyclohexyl, bicyclohexyl, cyclohexylphenyl, phenyl or biphenyl group which may be substituted by a halogen atom, an alkyl group having 1 to 15 carbon atoms or alkoxy group having 1 to 15 carbon atoms; or a group of the formula, Alk—X, wherein Alk represents an alkylene group having 1 to 15 carbon atoms which may be branched and X represents a phenyl group which may be substituted by an alkyl group having 1 to 4 carbon atoms, nitrile group, a halogen atom or a hydroxyl group.

4,555,356

WOOD PRESERVATIVE SYSTEM COMPOSITION

Richard J. Guglielmo, Sr., Cresskill, N.J., assignor to EMA Company, Cresskill, N.J.

Continuation-in-part of Ser. No. 888,373, Mar. 20, 1978, Pat. No. 4,393,102, and a continuation-in-part of Ser. No. 341,275, Jan. 21, 1982. This application Jun. 27, 1983, Ser. No. 508,521
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[4] C09K *15/32*
U.S. Cl. 252—400 R 8 Claims

1. A wood preservative composition comprised of a tri-n-butyl tin ester selected from the group consisting of tri-n-butyl tin linoleate, bis(tri-n-buty)tin succinate, tri-n-butyl tin benzoate, tri-n-butyl tin salicylate and mixtures thereof in an amount of from 2 to 15 percent by weight in a solvent system.

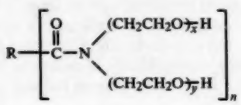
4,555,357

POLYACETAL RESIN COMPOSITION

Takuzo Kausga; Yukio Ikenaga, and Kunio Suzuki, all of Fuji, Japan, assignors to Polyplastics Company, Ltd., Osaka, Japan

Filed Sep. 12, 1983, Ser. No. 531,551
Claims priority, application Japan, Sep. 16, 1982, 57-161500
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—511 12 Claims

1. A thermally stable, electrically conductive polyacetal resin composition, comprising a polyoxymethylene or a polyacetal copolymer having consecutive oxymethylene units in its main chain, 3–30 weight % based on the total resin composition of electrically conductive carbon black, and 0.1–15 weight % based on the total resin composition of an amide compound represented by the general formula:



wherein R represents a carboxylic acid residue selected from saturated and unsaturated hydrocarbon groups having 2–23 carbon atoms or a basic unit of a vinyl polymer or a vinyl copolymer, x and y are each 0 or an integer of 1–10 and n is an integer of 1–6.

4,555,358

ELECTRICALLY CONDUCTIVE SINTERED CERAMICS AND CERAMIC HEATERS

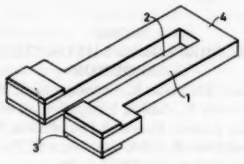
Yasuo Matsushita; Kousuke Nakamura, and Koji Harada, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1983, Ser. No. 497,577
Claims priority, application Japan, May 28, 1982, 57-89926
Int. Cl.[4] H01B *1/04*
U.S. Cl. 252—516 5 Claims

1. A ceramic heater comprising a heater element consisting of an electrically-conductive, sintered ceramic body and heat-resistant metallic elements adapted to connect power-supply wires to both ends of said heater element, said ceramic body consisting essentially of (a) silicon carbide and (b) a non-oxide

ceramic material other than silicon carbide which exhibits a positive resistance-temperature coefficient, said component (b) consisting of at least one substance selected from the group consisting of zirconium boride, titanium boride, zirconium silicide, molybdenum silicide, tantalum silicide, titanium nitride, zirconium nitride, tantalum carbide, zirconium carbide, titanium carbide, tantalum boride, hafnium boride, hafnium nitride, niobium boride, niobium carbide and tungsten carbide, the quantity of powder of said component (b) being 10 to 200 parts by weight based on 100 parts by weight of power of said component (a), said electrically-conductive, sintered ceramic body thereby exhibiting a generally positive resistance-temperature coefficient and a resistivity smaller than 1 Ωcm.

2. A ceramic heater comprising a heater element consisting of an electrically-conductive, sintered ceramic body and heat-resistant metallic elements adapted to connect power-supply wires to both ends of said heater element, said ceramic body consisting essentially of (a) silicon carbide, (b) a non-oxide



ceramic material other than silicon carbide which exhibits a positive resistance-temperature coefficient and (c) a sintering additive, said component (b) consisting of at least one substance selected from the group consisting of zirconium boride, titanium boride, zirconium silicide, molybdenum silicide, tantalum silicide, titanium nitride, zirconium nitride, tantalum carbide, zirconium carbide, titanium carbide, tantalum boride, hafnium boride, hafnium nitride, niobium boride, niobium carbide and tungsten carbide, the quantity of powder of said component (b) being 10 to 200 parts by weight based on 100 parts by weight of powder of said component (a), said electrically-conductive, sintered ceramic body thereby exhibiting a generally positive resistance-temperature coefficient and a resistivity smaller than 1 Ωcm, and said sintering additive (c) consisting of a substance selected from the group consisting of an aluminum compound and a boron compound, the quantity of said sintering additive in the mixture of (a), (b) and (c) being between 0.1 to 3% by weight, based on the aluminum or boron content.

4,555,359

TRIMETHYLBICYCLO [4.3.0] NON-1-ENE DERIVATIVES

Klaus Bruns, and Ursula Weber, both of Krefeld-Traar, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jan. 18, 1983, Ser. No. 458,744

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212326

Int. Cl.⁴ A61K *7/46*; C11B *9/00*

U.S. Cl. 252—522 R **17 Claims**

1. A fragrant mixture of three isomers of trimethylbicyclo[4.3.0]non-1-ene wherein the methyl groups are positioned in the respective isomers in the 7,9,9, the 7,7,9 and the 6,8,8 positions and which are substituted in the 4 and 5 positions by substituents selected from the group consisting of hydrogen, lower alkyl, carbaldehyde and lower alkanoyl wherein at least one carbaldehyde or one lower alkanoyl is present in either the 4 or 5 position but not in both.

4,555,360

MILD DETERGENT COMPOSITIONS

Donald L. Bissett, Hamilton, and Mark H. K. Mao, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 22, 1984, Ser. No. 623,817

Int. Cl.⁴ C11D *1/75, 1/83, 1/90, 1/94*

U.S. Cl. 252—541 **2 Claims**

1. A mild foaming detergent composition comprising:

(1) from about 10% to about 40% of a mild, water-soluble, foaming anionic detergent surfactant having the generic formula RE_xSM wherein R is an alkyl group containing from about 12 to about 15 carbon atoms; E represents an ethylene oxide moiety; x is a number from about 1 to about 12 on the average; S is a sulphate group; and M is selected from the group consisting of alkaline metal, alkaline earth metal, ammonium and substituted ammonium cation;

(2) from about 1% to about 10% of a surfactant selected from the group consisting of cetyl dimethyl betaine, cetyl amido propyldimethyl betaine, and mixtures thereof;

(3) from about 2% to about 10% of an alkyldimethylamine oxide suds booster wherein the alkyl group contains from about 10 to about 14 carbon atoms, wherein when said composition contains harsh surfactants such as C_{10-16} alkyl sulfates and C_{6-13} alkylbenzene sulfonates, said harsh surfactants are complexed with the amine oxide compound to make them milder, and wherein the ratio of (1) to (2) is from about 3:1 to about 10:1.

4,555,361

METHOD OF REDUCING THE VOLUME OF SOLID RADIOACTIVE WASTE

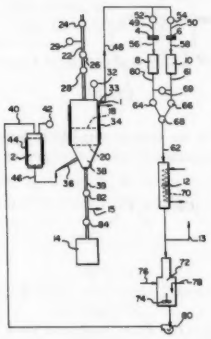
Leo P. Buckley; Kenneth A. Burrill, both of Deep River; Conrad D. Desjardins, and Robert S. Salter, both of Fredericton, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 17, 1983, Ser. No. 495,538

Claims priority, application Canada, Aug. 8, 1982, 409849

Int. Cl.⁴ G21F *9/14, 9/32*

U.S. Cl. 252—626 **5 Claims**



1. A method of reducing the volume of solid radioactive waste, comprising:

(a) pyrolyzing the radioactive waste in the interior of a vessel, while

(b) passing superheated steam through the vessel at a temperature in the range 500° to 700° C., a pressure in the range 1.0 to 3.5 MPa, and at a flow rate in the range 4 to 50 grams/second/cubic meter of the volume of the vessel interior, to cause pyrohydrolysis of the waste and to remove carbon-containing components of the waste from the vessel as gaseous decomposition products in the form of carbon monoxide and hydrogen leaving an ash residue in the vessel,

(c) filtering any entrained particles present with the gaseous decomposition products,
(d) removing any acidic vapours present with the gaseous decomposition products by solid sorbent,
(e) condensing steam and any organic substances present with the gaseous decomposition products, and
(f) removing the ash residue from the vessel.

4,555,362

METHOD AND INTERMEDIATES FOR PRODUCING α-L-ASPARTYL-L-PHENYLALANINE

Hugh L. Dryden, Jr, Deerfield, and John B. Hill, Woodstock, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 580,912, Feb. 16, 1984, which is a division of Ser. No. 506,465, Jun. 20, 1983, Pat. No. 4,440,677. This application May 15, 1984, Ser. No. 610,376

Int. Cl.[4] C07C *103/52*

U.S. Cl. 260—112.5 R **2 Claims**

1. A chemical reaction mixture for preparing α-L-aspartyl-L-phenylalanine methyl ester containing a compound of the class consisting of N-acetoacetyl-L-aspartic acid, N-acetoacetyl-L-aspartic anhydride and N-acetoacetyl-α-L-aspartyl-L-phenylalanine.

4,555,363

PROCESS FOR THE PREPARATION OF β-LACTAM COMPOUNDS

Peter H. Milner, Ridgwick, England, assignor to Beecham Group p.l.c., England

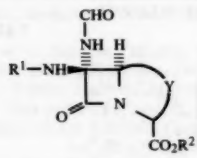
Filed Jan. 19, 1984, Ser. No. 572,196

Claims priority, application United Kingdom, Jan. 21, 1983, 8301688; Jun. 24, 1983, 8317199

Int. Cl.[4] C07D *499/04, 501/02*

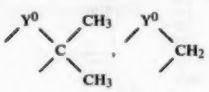
U.S. Cl. 260—239.1 **9 Claims**

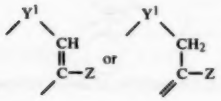
1. A process for the preparation of a compound of formula (III) or a salt thereof:



(III)

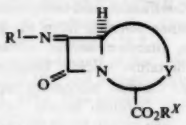
wherein R^1 is an acyl group, R^2 is hydrogen or a readily removable carboxyl protecting group; and Y is





wherein Y^o is sulphur, SO or SO_2, Y^1 is oxygen, sulphur, SO, SO_2 or $—CH_2—$ and Z represents hydrogen, halogen, or an organic group such as C_{1-4} alkoxy, $—CH_2Q$ or —CH=CH—Q

wherein Q represents hydrogen, halogen, hydroxy, mercapto, cyano, carboxy, carbamoyloxy, carboxylic ester, C_{1-4} alkyloxy, acyloxy, aryl, heterocyclyl group bonded via carbon, a heterocyclylthio group or a nitrogen containing heterocyclic group bonded via nitrogen, which process comprises treating an intermediate imine of formula (IV):



(IV)

wherein any reactive groups may be protected; R^1 and Y are as hereinbefore defined; and R^x is a readily removable carboxy protecting group; with a nucleophilic derivative of formamide and thereafter, if necessary, carrying out one or more of the following steps:
(i) removing any protecting groups;
(ii) converting a group R^x to a group R^2;
(iii) converting one group Z into a different group Z;
(iv) converting the product into a salt.

4,555,364

METHOD FOR PREPARING 1-HYDROXYVITAMIN D COMPOUNDS

Hector F. DeLuca; Heinrich K. Schnoes; Seok H. Lee, all of Madison, and Mary E. Phelps, Stoughton, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 1, 1984, Ser. No. 667,296

Int. Cl.[4] C07J *9/00*

U.S. Cl. 260—397.2 **11 Claims**

1. A method for preparing 1-hydroxyvitamin D compounds, which comprises treating a 1-hydroxy-3,5-cyclovitamin D compound with a mixture of dimethylsulfoxide and an organic acid, whereby the non-acylated 1-hydroxyvitamin D compound and its 5,6-trans-isomer are obtained in admixture and, optionally, separating said mixture to recover one or both 1-hydroxyvitamin D components.

4,555,365

ISOPRENYLIC ACID AMIDE DERIVATIVES

Yoshiyuki Tahara, Tsurugashima; Toshihiro Takahashi, Kawagoe; Hiroyasu Koyama, Ageo; Yoshikuni Suzuki, Ohmiya, and Masatoshi Yasuda, Kitakyushu, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

Filed Feb. 17, 1984, Ser. No. 581,345

Claims priority, application Japan, Feb. 21, 1983, 58-26215

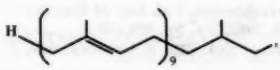
Int. Cl.[4] C07C *103/133*

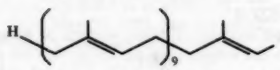
U.S. Cl. 260—404 **6 Claims**

1. An isoprenylic acid amide derivative represented by the general formula

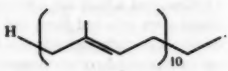
$$R_1—CO—NH_2$$

wherein R_1 is





or



4,555,366
NON-EMISSIVE, FLAME-RETARDANT COATING COMPOSITIONS

Stephen D. Rodgers, Bowie, Md.; Richard J. Dick, Columbus, and Vincent D. McGinnis, Delaware, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 199,843, Oct. 23, 1980, Pat. No. 4,405,761. This application Sep. 29, 1982, Ser. No. 427,908

Int. Cl.⁴ C09F *5/00, 7/00*; C11C *3/00*

U.S. Cl. 260—404.8 **7 Claims**

1. A cationic, non-emissive, non-flame promoting, room-temperature curable surface-active agent which comprises a polyhalogenated compound containing a cationic group and a room-temperature curable group selected from the group consisting of an oxirane group, an air-dryable group derived from an air-dryable fatty acid, an air-dryable allyl ether group, and combinations thereof.

4,555,367
PURIFICATION OF ACRYLONITRILE

Joseph M. Schmitt, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 362,364, Mar. 26, 1982, abandoned, Continuation-in-part of Ser. No. 258,104, Apr. 27, 1981, abandoned. This application Jan. 3, 1984, Ser. No. 571,631

Int. Cl.⁴ C07C *121/32*

U.S. Cl. 260—465.9 **8 Claims**

1. A method for reducing the acrolein impurity content in an acrylonitrile monomer composition containing a finite amount of acrolein impurity in an amount of 24 parts per million or less of acrolein, said method comprising contacting the acrylonitrile-acrolein mixture with an amount of an alkali metal borohydride effective to reduce the content of said acrolein impurity but insufficient to catalyze polymerization of said acrylonitrile monomer composition.

4,555,368
PROCESS FOR SYNTHESIZING DIORGANOMONOTHIOPHOSPHINATES

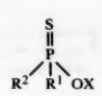
Allan J. Robertson, Thorold, Canada, assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 28, 1984, Ser. No. 675,492

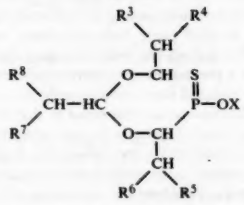
Int. Cl.⁴ C07F *9/30*

U.S. Cl. 260—502.4 R **10 Claims**

1. A method for making a diorganomonothiophosphinate compound of the formula:



wherein R^1 and R^2 are each, independently, selected from saturated and unsaturated hydrocarbyl radicals, alkyl polyether radicals, and aromatic radicals; and such radicals optionally and independently substituted with polar groups selected from halogen, nitrile and nitro groups; or wherein R_1 and R_2 together form a heterocyclic ring having the formula:



wherein R^3, R^4, R^5, R^6 R^7 and R^8 are each, independently, selected from hydrogen and C_1–C_{12} alkyl; and X is selected from the group consisting of hydrogen, alkali or alkaline earth metals and NH_4; said process comprising:

(a) providing a reactive mixture of at least one diorganophosphine compound of the formula:

in an aqueous medium;

(b) oxidizing the diorganophosphine compound in (a) under controlled temperature conditions of between about 40° to about 60° C. by adding an amount of an oxidizing agent sufficient to oxidize substantially all of the diorganophosphine in (a) to the corresponding diorganophosphine oxide;

(c) heating the reactive mixture of step (b) to an elevated temperature and adding an excess amount of sulfur and an excess amount of an hydroxide compound selected from the group consisting of water, alkali metal or alkaline earth metal hydroxides and ammonium hydroxide; and

(d) thereafter permitting the reaction to proceed until formation of the diorganomonothiophosphinate compound is substantially complete.

4,555,369
FLUORINATED ETHER ACYL FLUORIDES HAVING ALKYLTHIO OR ALKYLSULFONE GROUPS

Kyoji Kimoto, Kanagawa; Hirotsugu Miyauchi, Tokyo; Jukichi Ohmura, Kanagawa; Mikio Ebisawa, Kanagawa, and Toshioki Hane, Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

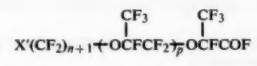
Division of Ser. No. 299,164, Sep. 3, 1981, Pat. No. 4,510,328, which is a division of Ser. No. 152,847, May 23, 1980, Pat. No. 4,329,434. This application Aug. 29, 1983, Ser. No. 527,425

Claims priority, application Japan, May 31, 1979, 54-67888; May 31, 1979, 54-67889; Jul. 9, 1979, 54-85852; Jul. 18, 1979, 54-90301; Jul. 18, 1979, 54-90302

Int. Cl.⁴ C07C *53/50*

U.S. Cl. 260—544 F **5 Claims**

1. A fluorinated acid fluoride represented by the formula:



wherein X' is —SR or $—SO_2R$, R is C_1–C_{10} alkyl, C_1–C_{10} perfluoroalkyl, an aryl or chlorine, n is an integer of 2 to 4 and p is an integer of 0 to 50.

4,555,370
PROCESS FOR THE PREPARATION OF ACYL CYANIDES

Erich Klauke, and Kurt Findeisen, both of Odenthal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 487,242, Apr. 27, 1983, abandoned, which is a continuation of Ser. No. 252,717, Apr. 10, 1981, abandoned. This application Oct. 5, 1984, Ser. No. 658,444

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015587

Int. Cl.⁴ C07C *121/76*

U.S. Cl. 260—545 R **19 Claims**

1. In a process for the preparation of an acyl cyanide of the formula

(I)

wherein

R is an optionally substituted alkyl with 1 to 8 carbon atoms; an optionally substituted cycloalkyl with 3 to 12 carbon atoms; an optionally substituted aryl; an optionally substituted 5- or 6-membered heterocyclic radical which can additionally be fused to a benzine ring,

the improvement comprising reacting a carboxylic acid fluoride of the formula

R—CO—F (II)

in which

R is identified as above,

with an alkali metal cyanide, in the absence of a heavy metal salts catalyst or a phase transfer catalyst, at a temperature of from 20° to 150° C.

4,555,371

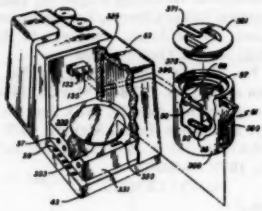
CARBONATOR FOR A BEVERAGE DISPENSER

Edward L. Jeans, Monmouth, Wales, assignor to Cadbury Schweppes, Plc, London, England

Continuation-in-part of Ser. No. 140,685, Apr. 16, 1980, abandoned. This application Jun. 29, 1982, Ser. No. 393,298

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—122 24 Claims



19. A diluent tank for use in a beverage dispenser comprising:

(a) a tank body for containing a supply of diluent having a threaded opening therein;

(b) a threaded cover for covering said sealing said opening;

(c) means for relieving pressure in said tank prior to removal of said cover;

(d) means for connecting a source of pressurizing gas to said tank and for conducting diluent from said tank; and,

(e) means for preventing said cover from being fully removed from said body upon removal of said cover by rotation until after, the seal between said cover and body is broken, whereby if said means for relieving pressure fails, gas can escape without having said cover blow off.

20. A removable batch type diluent tank for use in a beverage dispenser comprising:

(a) a tank body for containing a supply of diluent having an opening therein;

(b) a removable cover for covering and sealing said opening;

(c) means for relieving pressure in said tank prior to removal of said cover;

(d) mechanical interlock means for preventing removal of said cover until said means for relieving pressure are operated;

(e) a quick disconnect coupling for connecting a source of pressurizing gas to said tank; and

(f) means for conducting diluent from said tank.

4,555,372

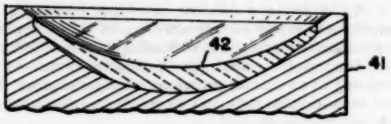
ROTATIONAL MOLDING OF CONTACT LENSES

Wilhelm F. Kunzler, Fairport, N.Y., and William F. Coombs, Punta Gorda, Fla., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 246,826, Mar. 21, 1981. This application Apr. 4, 1983, Ser. No. 481,600

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—2.1 2 Claims



1. In a casting process for preparing contact lenses, the improvement which comprises

(a) charging to the mold having the negative surface of the desire anterior lens surface an excess of monomer solution,

(b) spincast curing the monomer solution to obtain a lens which is thicker than desired, and

(c) lathe cutting only the posterior of said lens to obtain the desired thickness.

4,555,373

PRESSING OF REINFORCED THERMOSETTING POLYMER ARTICLES

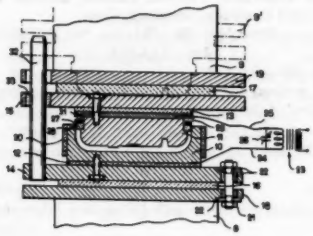
Willem Bloemkolk, deceased, late of Viviers du Lac (by Christiane Bloemkolk, legal representative), and André Blanc, La Ravoire, both of France, assignors to Vitrotex Saint-Gobain, Aubervilliers, France

Filed Mar. 30, 1983, Ser. No. 480,312

Claims priority, application France, Mar. 3, 1982, 82 05397

Int. Cl.[4] B29C *1/02*

U.S. Cl. 264—25 4 Claims



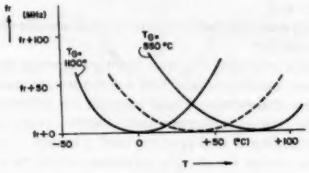
1. The process of pressure molding a charge of reinforced thermosetting polymeric material into a molded piece comprising exerting pressure by relative movement of a pair of mold elements toward one another and said charge of material within a mold cavity, substantially simultaneously subjecting said charge of material to internal heating by dielectric losses under high frequency, maintaining said internal heating during formation of a molded piece under pressure, and until said molded piece is cured, all the while bringing the core of said molded piece to a prescribed temperature, said mold elements being thermally isolated from outside ambient conditions and having a calorific capacity at least equal to that of the material from which said molded piece is formed whereby heat transmitted from the mold cavity by conduction is stored in said mold elements, and using the mold elements as an external heat source to at least partially heat the next charge of said material as soon as it is introduced to said mold cavity after removal of said molded piece.

4,555,374

METHOD OF MANUFACTURING A DISC RESONATOR

Peter Roschmann, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 189,286, Sep. 22, 1980, abandoned. This application Nov. 9, 1984, Ser. No. 670,086
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941994
Int. Cl.[4] H01F *1/34*; C30B *33/00, 29/28*
U.S. Cl. 264—40.1 3 Claims



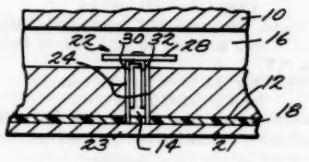
1. A method of manufacturing a disc resonator comprising the steps of:
providing a single crystal of a magnetic garnet having the composition $Y_3(Fe_{2-x}M_x)(Fe_{3-y}M_y)O_{12}$, where M is a nonmagnetic ion which can occupy both octahedral and tetrahedral sites; and
cutting the crystal into thin discs;
characterized in that in order to obtain a temperature coefficient of the resonant frequency which is approximately zero at a temperature within a desired temperature range, the method further comprises the steps of:
measuring the temperature at which the temperature coefficient of the resonant frequency of the crystal is approximately zero, this temperature being the initial compensation temperature;
estimating the temperature at which the crystal can be annealed without changing the initial compensation temperature, this estimated temperature being known as a reference temperature; and
annealing the crystal at a temperature above the reference temperature if the desired temperature range is below the initial compensation temperature, or annealing the crystal at a temperature below the reference temperature if the desired temperature range is above the initial compensation temperature.

4,555,375

METHOD AND APPARATUS FOR IN MOLD COATING

John A. Sergovic, Severna Park, and John L. McClinton, Hanover, both of Md., assignors to Burns & Russell Company, Baltimore, Md.

Filed Dec. 7, 1983, Ser. No. 558,883
Int. Cl.[4] B29C *5/00, 1/06*
U.S. Cl. 264—259 13 Claims



1. A method of applying a coating composition of the type using a curable resin and a filler to the planar surface of a building article where the surface has a perimeter and a discontinuity within the perimeter, comprising the steps of:
depositing the composition in flowable form in a mold,
placing the surface of the building article in the mold with the composition distributed over said surface and the discontinuity therein,
inserting boundary means having a boundary edge through said discontinuity so that said edge penetrates the composition,
subjecting the composition to heat to cure the composition and form a hardened glaze on the surface of the article,
removing the article from the mold, and
removing the boundary means from the discontinuity.

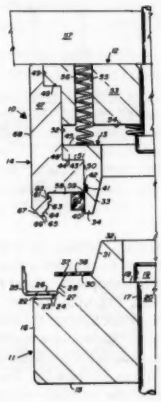
10. A molding apparatus, for forming a glazed surface on an article where the surface includes a discontinuity having a boundary, comprising a mold pan for receiving a molding composition and the surface of the article and a wall means insertable through the surface and conforming to the boundary of the discontinuity, said article being a building block and the surface having a perimeter, said discontinuity being a U-shaped slot extending from the perimeter of said surface, said wall means being a U-shaped plate which closely engages the slot, said slot having a length that is greater than the depth of the slot, said U-shaped plate having parallel legs and bridge means extending between said legs to maintain said legs in a fixed relation.

4,555,376

MOLDING AN ELASTOMERIC RING WHILE BONDING IT TO A METAL CASE AND TO A FLUOROCARBON WASHER

John D. Butler, Van Wert, Ohio, assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Mar. 12, 1984, Ser. No. 588,718
Int. Cl.[4] B29D *3/00*
U.S. Cl. 264—266 15 Claims



1. A mold comprising:
a base molding member having a radially outer case-supporting portion and, spaced inwardly and away therefrom, a sloping frustoconical mold surface which ends at an inwardly extending upper ledge,
a two-part upper mold assembly having first and second mold members,
said first mold member having a lowermost generally horizontal toothed portion with a series of concentric sharp tooth edges in line with the radially inward portion of said ledge, and a cylindrical wall portion leading up from the outer edge of the toothed portion to an upper radially outwardly extending flange having a lower surface and an upper surface,
said second mold member having a cylindrical inner wall engaging the cylindrical wall portion of said first mold

member, a ledge at the upper end thereof against which the lower surface of said outwardly extending flange can abut, a spacing means leading from the outer edge of said ledge to an upper radially inwardly extending surface,

spring means engaging said upper surface of said first upper mold member and urging it down against said ledge of said second mold member, but compressible so that said second mold member can move down relative to said first mold member after said first mold member bottoms against said upper ledge of said base molding member,

said second upper mold member also having a mold-cavity-defining lower surface lying radially outwardly from its said cylindrical inner wall and extending downwardly for closing off said mold cavity,

said cylindrical wall portion of said first mold member normally extending down well below the lower extremity of the cylindrical inner wall of said second mold member and defining an annular corner portion against which a ring of uncured elastomer is placed just prior to molding, and

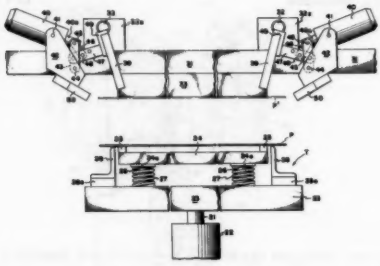
mold closing means for forcing said upper mold assembly down to bottom said toothed portion and forcing said second mold member down relatively to said first mold member against the pressure of said spring means.

4,555,377

THERMOFORMING METHODS AND APPARATUS

Robert C. Whiteside, Harrison; Albert W. Arends, Gladwin, and Roland Karklin, Beaverton, all of Mich., assignors to Leesona Corporation, Beaverton, Mich.

Filed Aug. 24, 1983, Ser. No. 526,077
Int. Cl.[4] B23B *11/08*
U.S. Cl. 264—292 **10 Claims**



1. In a thermoforming method for a machine having, a load station with a platform to receive a thermoplastic sheet to be molded where said thermoplastic sheet has edges overhanging the platform and said machine further comprising a heating station with a heating mechanism therein, a downstream mold station with a differential pressure mold member for differential pressure forming articles in thermoplastic sheets, and a conveying clamp frame carrier for the plastic sheets which moves in a path from the heating station to the mold station; said carrier comprising an expandable and contractible side frame assembly, with a pair of relatively movable opposed side frames, each of said opposed side frames having a movable clamp thereon, said frame assembly perimetrally defining an open mid-portion of a size to expose the mid-portion of a clamped sheet to heat at the heating station, one of said side frames having a generally vertical extending outboard surface for coaction with the clamp thereon where said clamp is movable angularly toward and away from said outboard surface the steps of:

a. relatively moving said carrier and platform vertically to fold at least one entire edge of a sheet generally vertically out of the plane of the sheet to a position alongside the said generally vertically extending outboard surface;

b. releasably clamping opposed edges of said sheet, to the carrier including the step of moving the clamp carried by said one side frame angularly toward said outboard surface to clamp the folded edge against said outboard surface and, transferring the carrier to the heating station; and heating the clamped sheet to a forming temperature;

c. transferring the carrier with the heated sheet to the mold station and relatively moving said one side frame and said opposed side frame to change the generally horizontal distance between said clamps on the opposed side frames and vary the sag in said sheet developed in the heating thereof;

d. relatively moving the mold member and carrier from a removed position to a sheet engaging position in which the mold member is in general planar alignment with said carrier; and

e. applying a differential pressure to conform the sheet to the mold member.

4. In a thermoforming machine having a heating station with a heating mechanism therein, and a downstream mold station with a differential pressure mold member for differential pressure forming articles in thermoplastic sheets having perimetral edges surrounding a mid-portion, and wherein a conveying clamp frame carrier for the plastic sheets moves on a frame in a path from the heating station to the mold station; the improvement wherein

a. said carrier comprises an expandable and contractible frame assembly perimetrally defining an open mid-portion of a size to expose the mid-portion of the clamped sheet to heat at the heating station while supporting edges of the sheet so that the sheet can be heated to a forming temperature;

b. said frame assembly including generally vertically extending opposite side plate members having outboard sides, at least one said side plate members being mounted for vertical swinging movement about a generally horizontal axis, means operable for folding edges of a plastic sheet to be carried around said outboard side of said at least one sideplate member, and said at least one side plate member carrying a clamp, movable angularly to said outboard side of said at least one side plate member toward and away from released and gripping positions against said folded around edge and said outboard side, for gripping opposite perimetral edges of the sheet, and actuators for operating said clamps to grip and release the opposite edges of the sheet;

c. means for relatively moving the mold member and carrier from a removed position to a sheet-engaging position in which the mold member is in general planar alignment with said carrier for receiving and forming the sheet; and

d. means carried by said carrier operable to relatively swing said at least one side plate member vertically relatively to an opposed side plate member carrying a clamp about said axis to vary the generally horizontal distance between said opposed side plate members while said clamps are in gripping position, and before the mold member is in sheet-engaging position.

4,555,378

METHOD OF FORMING THERMOPLASTIC PERFORATED SHEET

Richard A. Martin, Tarrytown, N.Y., and Walter Bialobrzeski, Wallingford, Conn., assignors to Dick Martin Design Ltd., Tarrytown, N.Y.

Filed Apr. 13, 1984, Ser. No. 600,139
Int. Cl.[4] B29C *17/02, 1/02*
U.S. Cl. 264—292 **18 Claims**

1. In an apparatus for cold drawing a generally flat perforated plastic sheet, the apparatus including

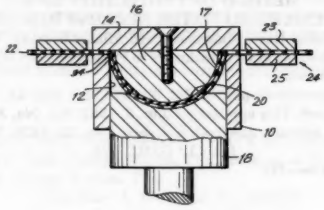
a die having a bore therein terminating in an aperture,

first means for holding said sheet adjacent said aperture, and

a punch having a curved contact surface, said punch being movable from a start position spaced from said sheet to a first position pressing a portion of said sheet into said aperture and forming a depression in said sheet,

the improvement in combination therewith comprising:

a pressure pad having an end surface with a recess in the center thereof, said pad having a first position inside said bore with said end surface adjacent said aperture and engaging and supporting said sheet while said punch is pressed downward, deforming said sheet into said recess said punch and pad being further movable to a second position, said punch pressing said sheet and pad together further into said bore and further deforming said sheet to have the shape of said contact surface while said pad



remains engaging and supporting said deformed portion of said sheet, and

drive means for moving said punch between said start, first and second positions,

said punch further comprising on said contact surface a layer of material having durometer less than that of said sheet, said layer becoming embedded in perforations in said sheet when the punch is pressed to said first position, thereby establishing a mechanical coupling of said punch and sheet in the area of said embedded engagement.

4,555,379

CROSS-LINKABLE ROTATIONAL MOLDING COMPOSITIONS

Melvin F. Maringer, Cincinnati, Ohio, and Fred K. Morgan, Cold Springs, Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 497,313, May 23, 1983. This application Apr. 3, 1985, Ser. No. 719,398

Int. Cl.[4] B28B *1/02*

U.S. Cl. 264—310 **9 Claims**

1. A process for preparing a rotationally molded article of a cross-linked ethylene polymer which comprises:

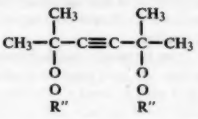
(a) placing in a rotational mold an ethylene polymer composition capable of being cross-linked during rotational molding which comprises:

(1) a linear polymer of ethylene having a density of above about 0.94, said polymer having been prepared by particle form polymerization in the presence of a catalyst composition comprising:

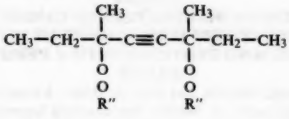
(i) the solid reaction product of (1) at least one nonhalide containing organic oxygenated compound of a metal selected from the metals of Groups Ia, IIa, IIb, IIIa, IVa, VIIb and VIII of the Periodic Table, with (2) at least one nonhalide containing organic oxygenated transition compound of a transition metal selected from the metals of Groups IVb, Vb and VIb of the Periodic Table, and with (3) an organo aluminum halide having the general formula $AlR_nR'_{3-n}$ in which R is a hydrocarbon radical containing 1 to 20 carbon atoms, R′ is a halide and n is any number such that $1 \leqq n \leqq 2$; and

(ii) an organo-metallic compound selected from the organic derivatives of metals of Groups Ia, IIa, IIb, IIIa and IVa of the Periodic Table, and,

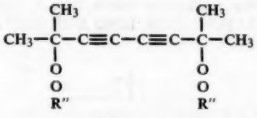
(2) a crosslinking effective amount of an acetylenic high molecular weight diperoxy compound selected from the group consisting of hexynes having the formula



octynes having the formula



and octynes having the formula



where R″ is selected from the group consisting of tertiary alkyl, alkyl carbonate and benzoate.

(b) biaxially rotating the mold about two perpendicular axes while heating the mold and contents at a temperature effective to crosslink and rotationally mold said composition,

(c) cooling said mold to about room temperature while maintaining said coaxial rotation, and

(d) removing the resultant rotationally molded article.

4,555,380

AIR-PRESSURE METHOD

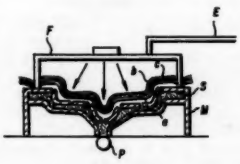
Shunsaku Munakata, Kawagoe; Hitoshi Ukai, Niiza; Mitsuru Noguchi, Tsurugashima, and Shinichi Sawai, Kunitachi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Tokyo Seat Co., Ltd., Asaka, both of, Japan

Filed Jun. 14, 1984, Ser. No. 620,599

Claims priority, application Japan, Jun. 16, 1983, 58-108992

Int. Cl.[4] B29C *17/04*

U.S. Cl. 264—510 **6 Claims**



1. A method of shaping a laminated sheet material formed from a base material, a skin material and a foamed resin layer therebetween, said method comprising the steps of:

(a) heating said laminated sheet material;

(b) positioning said heated, laminated sheet adjacent to a mold surface;

(c) placing a cover means over at least a portion of said laminated sheet adjacent said mold surface;

(d) forming a hermetic seal between said laminated sheet and said cover means, thereby defining a hermetically sealed space therebetween;

(e) increasing the air pressure in said hermetically sealed space to a pressure above atmospheric pressure and establishing an air cushion layer between the laminated material and the

surface of the mold from the air residing therebetween such that said at least portion of said laminated sheet takes a shape in substantial uniform thickness corresponding to said mold surface; and, thereafter,

(f) forcing the air from between said laminated sheet and said mold surface before the said laminated sheet is cooled substantially such that said at least a portion of said laminated sheet contacts said mold surface and conforms to the shape of the face of the mold.

4,555,381

PROCESS OF MAKING FOLDED CARDBOARD CONTAINER COVERED BY A LAYER OF SYNTHETIC MATERIAL AND PROVIDED WITH A PERIPHERAL FRAME

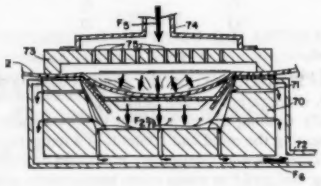
Guy A. Chazal, Sannois, and Jean A. Bodet, Versailles, both of France, assignors to Societe Parisienne d'Impression et de Cartonnage, Haute de Seine, France

Division of Ser. No. 307,833, Oct. 2, 1981. This application Mar. 23, 1983, Ser. No. 477,951

Claims priority, application France, Nov. 7, 1980, 80 23782

Int. Cl.[4] B29C *17/04;* **B29D** *3/02;* **B31F** *1/00*

U.S. Cl. 264—516 **5 Claims**



1. Process of making a container comprising an exterior portion of cardboard having a frame positioned in a single plane, wall panels and at least one bottom panel and a portion of a synthetic material formed of a single layer which is applied onto the surface of the cardboard portion forming the interior of the container and the exterior of the frame and which is adherent over the entire surface of the cardboard to which it is applied to maintain the relative position of the frame, the walls and the bottom panel comprising the steps of:

(a) providing a blank of a first type having a frame and a plurality of wall panels integral with the interior sides of the frame and a blank of a second type having a bottom panel and a plurality of wall panels integral with the exterior sides of said bottom panel;

(b) placing a blank of the first type and then at least one blank of the second type thereupon in a position and orientation with respect to a die hving the form and interior dimensions thereof corresponding to the exterior form and dimensions of the container to be made and whereby the frame of the blank of the first type is disposed over an edge of the die and the bottom panel of the blank of the second type is disposed substantially in vertical alignment with a bottom of the die;

(c) maintaining the frame of the blank of the first type applied against the edge of the die and maintaining the blank of the second type so that it cannot move laterally or change the orientation thereof relative to the form of the die;

(d) exerting a vertical push upon the common plane of the superimposed first and second blanks which is directed toward the bottom of the die to cause simultaneously the bending of the wall panels integral with the frame toward the bottom of the die, the folding of the wall panels which are integral with the bottom panel in the direction opposite to the direction of bending of the wall panels integral with the frame and the penetration of the bottom panels of the blank of the second type through the interior of the frame to the bottom of the die, so that all the wall panels integral with the frame and with the bottom panel are disposed in generally side-by-side, interfitted juxtaposition with the same alinement of the surfaces thereof by pressure against the walls of the die;

(e) applying a layer of synthetic material so that it extends over and adheres to the bottom panel to the frame and to all the wall panels whereby there is formed by the combination thereof a container which is rigid and tight.

4,555,382

METHOD OF PROTECTION OF A PRESSURIZED-WATER NUCLEAR REACTOR

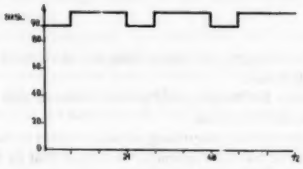
Michel Delor, Rueil Malmaison, and Michel Bruyere, Vaux Sur Seine, both of France, assignors to Framatome & Cie, Courbevoie, France

Continuation-in-part of Ser. No. 103,556, Dec. 13, 1979, abandoned. This application Jun. 8, 1982, Ser. No. 386,476

Claims priority, application France, Dec. 20, 1978, 78 35765

Int. Cl.[4] G21C *7/36*

U.S. Cl. 376—216 **3 Claims**



1. A method for protecting a pressurized-water nuclear reactor having fuel elements arranged in parallel with one another inside the core of said reactor delimiting coolant channels between them and between which control rods are moved by groups for the control of the reactor, which method enables avoidance of damaging said fuel elements by the appearance of the crisis of boiling and/or by the melting of at least one fuel pellet, comprising the steps of

(a) determining the level of power of the reactor from the measurements of inlet and outlet temperatures of the coolant in said reactor and of the pressure and flow of said coolant;

(b) determining the exact distribution of power in the axial direction of the core by measurements of neutron flux by ionization chambers arranged outside the reactor core, by measuring the ionization currents in each of said chambers;

(c) determining, from said level of power and the position of groups of control rods along the axial direction of the core a corrective factor or radial peaking factor, taking into account the distribution of power in the radial direction, at each point according to the position of said point in axial direction;

(d) determining the power released per unit length of said fuel elements, from said level of power, said radial peaking factor and said axial power at each point in axial direction, and comparing said power released to a predetermined limit;

(e) determining, from said radial peaking factor and said axial power, the ratio of the maximum increase of enthalpy in said coolant channels to the mean increase of enthalpy in the channels of said core, or enthalpy increase factor; and, thus, the maximum increase of enthalpy, corresponding to the hot channel of said core;

(f) determining from measured parameters of (a), from said maximum increase of enthalpy and predetermined correction terms, taking into account the mixing of coolant between the hot channel and adjacent channels, the margin with respect to the crisis of boiling for a number of points in the axial direction of the core; and

(g) triggering an emergency shutdown when at least one of

the two parameters comprising (1) margin with respect to the crisis of boiling along said fuel elements and (2) power released per unit length of said fuel elements, exceeds a predetermined limit; and,

(h) said core being divided along its entire height into a plurality of superposed vertical sections, the total neutron flux in each of said sections being determined from the ionization currents measured in each of said chambers, the axial power being considered as a polynome with respect to the axial position of the point where said power is developed and said axial power being determined accurately by comparing the integrated values of neutron flux obtained from polynomial form of the axial power and the total neutron flux in each of said sections of said core derived from the ionization currents measurements.

4,555,383

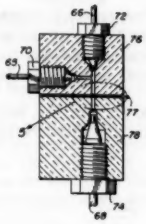
ELECTROLYTIC CONDUCTIVITY DETECTOR

Randall C. Hall, College Station, Tex., assignor to O. I. Corporation, College Station, Tex.

Filed Mar. 2, 1984, Ser. No. 585,491

Int. Cl.[4] G01N *31/08*

U.S. Cl. 422—89 **8 Claims**



1. A chromatographic system having a conductivity cell for deriving an output signal functionally related to a throughput fluid, comprising:

chromatographic means for generating a gas stream from a material sample,

means for generating a solvent stream effective to separate selected material species from said gas stream,

means for mixing said gas stream with said solvent stream to form a mixed gas-liquid phase stream of a throughput fluid and for passing the throughput fluid to an electrode assembly without gas-liquid separation, and

an electrode assembly for continuous axial flow of said mixed gas-liquid phase stream of said throughput fluid, having spaced first and second planar electrodes transverse to said axial flow and defining respective first and second boreholes for said axial flow of said mixed phase stream wherein an electrical output signal is obtained across said first and second electrodes during passage of said mixed phase stream axially through said boreholes.

4,555,384

APPARATUS FOR PRODUCING STYRENIC/ALKENYLNITRILE COPOLYMERS

Jeffrey D. Morris, and Robert A. Fuller, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Division of Ser. No. 423,489, Sep. 24, 1982. This application Sep. 23, 1983, Ser. No. 535,181

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.[4] C08F *220/44;* G05D *23/00*

U.S. Cl. 422—109 **26 Claims**

1. An apparatus for the continuous mass polymerization of styrenic and alkenylnitrile monomers to produce a styrenic-/alkenylnitrile copolymer, comprising:

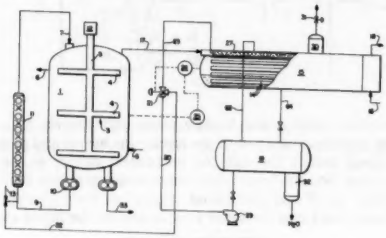
(a) a reaction vessel;

(b) means for continuously introducing a feed comprising a predetermined ratio of styrenic and alkenylnitrile monomers into said reaction vessel to produce a reaction mixture;

(c) means for subjecting the reaction mixture containing styrenic and alkenylnitrile monomers to conditions of temperature and pressure under which said monomers copolymerize to produce a styrenic/alkenylnitrile copolymer;

(d) a rotational agitator comprising at least one stirring device in the reaction vessel for subjecting the reaction mixture to horizontal agitation;

(e) means for subjecting the reaction mixture to vertical agitation, comprising means for withdrawing a portion of the reaction mixture from a position near the bottom of



the reaction vessel, at least one closed loop external of the reaction vessel for circulating the withdrawn portion and means for reintroducing the withdrawn portion at a position near the top of the reaction vessel;

(f) means for cooling the reaction mixture by withdrawing a vapor phase from the reaction vessel wherein said cooling means comprises a condenser for condensing the withdrawn vapor phase into a liquid and further wherein the amount of vapor phase withdrawn is controlled by including means in the condenser for selectively controlling the amount of cooled surface area available for contact with the withdrawn vapor phase; and

(g) means for continuously withdrawing styrenic/alkenylnitrile copolymer from the reaction vessel.

4,555,385

ELUTION PROCESS AND APPARATUS AND EXTRACTION OF PARTICULATE MATERIAL FROM A VESSEL

Alan M. Stone, Melbourne, Australia, assignor to Ok Tedi Mining Limited, Australia

Filed Aug. 19, 1983, Ser. No. 524,663

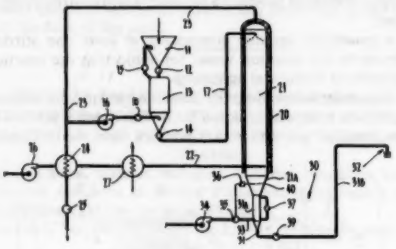
Claims priority, application Australia, Aug. 23, 1982, PF5515; Jul. 8, 1983, PG0204

Int. Cl.[4] B01D *11/02;* C01C *3/08;* C22B *3/02;* G05D *9/00*

U.S. Cl. 423—30 **36 Claims**

1. A continuous elution process for stripping at elevated temperature a value from a particulate carrier loaded with the value by means of a stripping liquid passing through a pressurized stripping vessel having opposite end parts, in which the loaded particulate carrier is fed to one end part of the stripping vessel and is displaced through the stripping vessel in counterflow to the stripping liquid introduced under pressure to the other end part of the stripping vessel whereby the particulate carrier is stripped of the value, the unladen particulate carrier being removed from said other end part of the stripping vessel at a location spaced from the input of said stripping liquid at the other end part and the loaded stripping liquid being removed from said one end part of the stripping vessel, and wherein the loaded particulate carrier is introduced under pressure through input pipe means into said one end part of the stripping vessel upstream, in the direction of flow of the stripping liquid, of where the loaded stripping liquid is removed

from said one end part in a liquid carrier as a low velocity slurry having a maximum liquid carrier to particulate carrier volume ratio of 5:1 from which at least a substantial part of the liquid carrier separates in the stripping vessel and is removed with the loaded stripping liquid, and wherein the slurry is



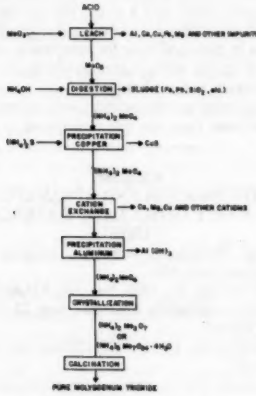
formed by feeding the loaded particulate carrier to a feed vessel communicating with the input pipe means and pumping the liquid carrier through the particulate carrier in the feed vessel and into the input pipe means under pressure until substantially all of said particulate carrier has been carried from the feed vessel into the input pipe means by the liquid carrier.

4,555,386

PROCESS FOR PURIFYING MOLYBDENUM TRIOXIDE

Michael J. Cheresnowsky, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 29, 1984, Ser. No. 584,845
Int. Cl.[4] C01G *39/00*
U.S. Cl. 423—54 **8 Claims**



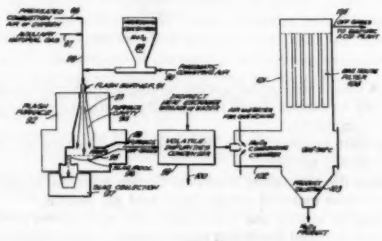
1. A method for preparing ammonium molybdate having low impurities aluminum, calcium, copper, magnesium, and iron from an impure concentrate of molybdenum trioxide comprising contacting said concentrate with an aqueous solution comprising about 2 to about 2.5 moles per liter of nitric acid, about 0.5 to 1 mole per liter of ammonium sulfate and less than 0.5 moles per liter ammonium nitrate to solubilize less than about 1.5 percent of the molybdenum values from said concentrate and solubilize a major portion of said impurities, wherein during contacting from about 0.85 parts to about 3 parts by weight aqueous solution is present per part of impure concentrate, washing the resulting concentrate, digesting said resulting concentrate with an aqueous solution of ammonium hydroxide at suitable concentrations to solubilize substantially all of the molybdenum values present in said resulting concentrate as ammonium molybdate and form an ammonium molybdate solution, adding ammonium sulfide to said ammonium molybdate solution in an amount sufficient to convert substantially all of the soluble copper values present in said solution to an insoluble copper sulfide, separating said ammonium molybdate solution from an insoluble residue, and contacting said resulting ammonium molybdate solution with a chelate cation exchange resin in ammonium form, removing ammonia to adjust the pH of said ammonium molybdate solution of from about 6 to about 8 to convert substantially all of the soluble aluminum values to an insoluble aluminum hydroxide, separating said resulting ammonium molybdate solution from a resulting insoluble residue, and concentrating said resulting ammonium molybdate to form ammonium molybdate having low impurities, aluminum, calcium, copper, magensium, and iron.

4,555,387

FLASH ROASTING OF MOLYBDENUM SULFIDE CONCENTRATES IN A SLAGGING REACTOR

Bruce J. Sabacky, Westminster, and Malcolm T. Hepworth, Golden, both of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Feb. 27, 1984, Ser. No. 583,905
Int. Cl.[4] C01G *39/02*
U.S. Cl. 423—59 **10 Claims**



1. A process for flash-roasting molybdenum sulfide containing slag-forming constituents which comprises,

feeding a pneumatically suspended stream of particulate molybdenum sulfide and a mixture of fuel and oxidizing gases through a nozzle into a confined furnace chamber,

said fuel gas-oxidizing gas mixture exiting from said nozzle being ignited to provide a flame thereof,

maintaining said flame at a condition to provide a temperature in the range of 1600° C.±200° C. to about 1800° C. in said furnace chamber sufficient to oxidize said molybdenum sulfide to molybdenum trioxide and thereby sublime said oxide, and to melt slag-forming constituents contained therein,

collecting liquid slag formed in said chamber,

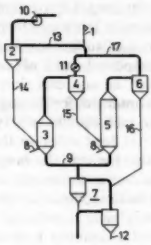
causing the resulting gases and any suspended solids including the sublimed molybdenum trioxide to flow from said furnace chamber to and through a condensing chamber, the temperature of said condensing chamber being controlled to above the condensing temperature of said sublimed molybdenum trioxide but below the volatilization temperature of volatile impurity species present and thereby effect a separation of the molybdenum trioxide from said impurities,

and then condensing and recovering the separated gaseous molybdenum trioxide as solids while removing off-gases comprising carbon oxides, H_2O, N_2, excess O_2 and SO_2.

4,555,388
METHOD AND APPARATUS FOR CALCINING RAW PHOSPHATE MATERIAL

Soren Hundebol, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Dec. 5, 1983, Ser. No. 558,117
Claims priority, application Denmark, Dec. 7, 1982, 5408/82
Int. Cl.[4] C01F *5/00, 11/00;* C01B *25/26;* F27B *15/00*
U.S. Cl. 423—167 6 Claims



1. A method of calcining raw phosphate material containing organic compound and sulphide pollutants, comprising

(a) introducing the material to be calcined into a first stage suspension reactor, suspending and conveying said raw material in a gas flow of combustion air which flows at a velocity of at least 2 m/sec, and supplying fuel to said gas flow whereby the main part of the said organic components is burnt together with said fuel at a reaction temperature of between 700° and 850° C., and maintaining the oxygen surplus in the reactor in the range of 0–3%, and retaining the said material in the first stage reactor for at least 1.5 secs,

(b) removing the material from the reactor and separating the material from the gas flow in a separator,

(c) introducing the material into a second stage reactor after the material has been heated in said first stage reactor, the second stage reactor being a suspension reactor, suspending and conveying said preheated raw material in a gas flow of combustion air which flows at a velocity of at least 2 m/sec, and supplying fuel to said gas flow whereby remaining organic components and sulphides are burnt together with said fuel; the reaction temperature being between 700° and 850° C.; and maintaining the oxygen surplus in the second stage which is larger than and at least double of that of the first stage, the retention time of the second stage being at least double of the retention time of the first stage, and

(d) discharging the material from said second stage.

4,555,389
METHOD OF AND APPARATUS FOR BURNING EXHAUST GASES CONTAINING GASEOUS SILANE

Eietsu Soneta, Kawasaki, and Tetsukazu Urata, Iruma, both of Japan, assignors to Toyo Sanso Co., Ltd., Tokyo, Japan

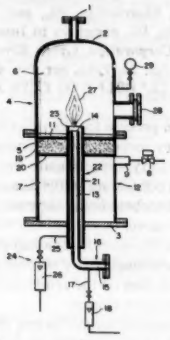
Filed Apr. 27, 1984, Ser. No. 604,720
Int. Cl.[4] B01J *12/00;* B01D *47/00;* C01B *33/04*
U.S. Cl. 423—210 5 Claims

5. An improved method of processing exhaust gases containing gaseous silane wherein exhaust gases which are discharged from a reactor are burned through a reaction with air in a combustion chamber and then the burning products are treated in a scrubber, the improvement which comprises:

a step of previously diluting the exhaust gases to be introduced into the combustion chamber with an inert gas so that the concentration of the gaseous silane contained in the exhaust gases is reduced to less than 30% by volume,

a step of feeding the thus diluted exhaust gases from the nozzle of an exhaust gas introduction pipe to the combustion chamber, and

a step of feeding an inert gas to the vicinity of the nozzle top end of the exhaust gas introduction pipe to form a barrier of the inert gas atmosphere thereby contacting the diluted



exhaust gases introduced into the combustion chamber with the air ahead of the barrier of the inert gas atmosphere.

4,555,390
METHOD FOR REMOVING SULFUR OXIDES FROM HOT FLUE GASES

Vinay K. Bhatia, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Dec. 20, 1983, Ser. No. 563,358
Claims priority, application Denmark, Dec. 22, 1982, 5666/82
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—242 10 Claims

1. A method of removing sulfur oxides from hot flue gases comprising the steps of introducing liquid water and at least one absorption agent selected from the group consisting of calcium oxides, magnesium oxides, calcium hydroxides, magnesium hydroxides, alkali metal oxides, alkali metal hydroxides and alkali metal carbonates, into a rising stream of hot flue gases in a reaction zone, contacting the absorption agent with the sulfur oxide such that the sulfur oxide is absorbed thereby and reacted therewith in the presence of evaporating liquid water so as to produce a dry powder comprising reaction products and unreacted absorption agent suspended in flue gases, separating the powder from the flue gases in a separating zone and recirculating a portion of said powder to the reaction zone, said method further comprising the steps of introducing said rising stream of hot flue gases axially into said reaction zone, said reaction zone being shaped as a vertical cylindrical chamber with a divergent conical lower portion, retaining the gas in said reaction zone during a gas retention time of about from 1 to 5 seconds, reducing the velocity of the gas in the reaction zone by passing the gas upwardly through the divergent conical lower portion thereof from a range of about 10–60 m/sec. to a range of about 2–20 m/sec. so as to cause a boundary layer separation in the gas, said conical lower portion of the reaction zone having an apex angle between 12° and 120° thereby promoting said boundary layer separation, suspending the water, absorption agent and resulting dry powder in said rising stream of hot flue gases during a material retention time of 1 to 8 minutes, thereafter passing the dry powder from the upper portion of the reaction zone to a separating zone, precipitating the powder from the flue gases in the separating zone, and recirculating a portion of the powder to the reaction zone for further treatment.

4,555,391

DRY INJECTION FLUE GAS DESULFURIZATION PROCESS

Michael J. Cyran, Morrisville, Pa., and Kuei-Hsiung Wang, Arlington Heights, Ill., assignors to Intermountain Research & Development Corporation, Green River, Wyo.

Filed Jul. 24, 1984, Ser. No. 634,234
Int. Cl.[4] B01J *8/00*; C01B *17/00*
U.S. Cl. 423—244 23 Claims

1. A dry injection process for desulfurizing a flue gas stream with a soda-type dry sorbent, which comprises

(i) injecting a soda-type particulate dry sorbent into a hot flue gas stream containing sulfur dioxide to desulfurize the gas stream said sorbent being substantially all smaller than about 40 mesh sieve;

(ii) collecting the dry sorbent in a bag filter;

(iii) removing the collected dry sorbent from the bag filter;

(iv) recycling a portion of the removed sorbent for reinjection into the flue gas stream;

(v) cooling the recycled sorbent below the bag filter temperature, prior to its reinjection, to a temperature below about 90° C. at which the sodium utilization of the sorbent is enhanced; and

(vi) reinjecting the cooled, recycled sorbent into the hot flue gas stream at a ratio of from about 0.2:1 to 5:1 reinjected sorbent: fresh injected sorbent, based on their respective sodium contents.

4,555,392

PORTLAND CEMENT FOR SO_2 CONTROL IN COAL-FIRED POWER PLANTS

Meyer Steinberg, Melville, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 17, 1984, Ser. No. 661,842
Int. Cl.[4] B01J *8/00*; C01B *17/00*; F23B *7/00*; F23J *11/00*
U.S. Cl. 423—244 5 Claims

1. A method for reducing the sulfur dioxide emissions produced from the burning of fossil fuels which comprises directly injecting into a furnace boiler portland cement particles, in sufficient quantity so that the amount of portland cement present will be from about 2.8 to 5.6 times the amount of sulfur in the fuel being burned, based on the weight of the fuel, so that said cement particles react with said sulfur dioxide and remove said sulfur dioxide from the exhaust gas before the exhaust gas exits the boiler system.

4,555,393

METHOD FOR MAKING CARBON MICROFIBERS

Ian W. Sorensen, and Robert S. Kiwak, both of Ellicott City, Md., assignors to Bendix Corporation

Division of Ser. No. 432,216, Oct. 1, 1982, Pat. No. 4,472,541.
This application Jun. 21, 1984, Ser. No. 622,829
Int. Cl.[4] C01B *31/02*; D01F *9/12*
U.S. Cl. 423—447.1 4 Claims

1. A method for making carbon microfibers comprising the steps of:

immersing carbon fibers in an intercalating acid solution to weaken the intercrystal bonds betwen the crystallite planes of the carbon fibers;

stirring said intercalating acid solution with the immersed carbon fibers to separate the weakened crystallite planes from the carbon fibers to form carbon microfibers;

filtering said intercalating acid solution to separate said carbon microfibers from the acid solution: and

rinsing said separated carbon microfibers to remove the residual intercalating acid.

4,555,394

PROCESS FOR THE PREPARATION OF ALUMINA

Sachio Asaoka, Yokohama, and Takashi Sendo, Machida, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Jun. 1, 1984, Ser. No. 616,353
Int. Cl.[4] C01F *7/02, 7/34*
U.S. Cl. 423—626 10 Claims

1. In a process for the preparation of alumina, including forming an alumina hydrogel from aluminum hydroxide, and processing the alumina hydrogel into alumina, the improvement comprising the alumina hydrogel forming step which is conducted in the presence of sulfate ion and which comprises feeding an aluminum compound and a pH controlling agent to a reaction zone, in which an aqueous slurry containing seed aluminum hydroxide is contained, for mixing with said aqueous slurry while maintaining said aqueous slurry at a temperature of at least about 50° C. at feed rates so that the pH of said aqueous slurry is maintained within the range of 6–11 and that 0.2–5 mols/hour of aluminum components, in terms of elemental aluminum, are fed to said reaction zone per mole of the seed aluminum hydroxide originally contained in said aqueous slurry, whereby the seed aluminum hydroxide is caused to grow to the alumina hydrogel.

4,555,395

HYDRIDE COMPOSITIONS

Bruce E. Sirovich, Spring Valley; Robert L. Sandstrom, Chappaqua, both of N.Y., and Theo H. Fleisch, Warrenville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Sep. 27, 1982, Ser. No. 424,608
Int. Cl.[4] C01B *6/00, 6/24, 6/34*
U.S. Cl. 423—644 44 Claims

1. A composition capable of reversibly absorbing and desorbing hydrogen comprising a metal hydride treated with an effective amount of an organic compound capable of imparting improved flow properties to said hydride without substantially altering said hydride's ability to reversibly absorb and desorb hydrogen, said hydride being an alloy, a mixture, or an intermetallic compound each consisting essentially of metals consisting of elements of Groups IIA, IIIA, IVB, VB, VIB, VIIB, and VIII of the Periodic Table of Elements and being capable of reversibly absorbing and desorbing hydrogen, said composition having been prepared by the method which comprises: (a) treating said hydride with an effective amount of an organic composition capable of imparting improved flow properties to said hydride without substantially altering said hydride's ability to reversibly absorb and desorb hydrogen, said organic composition being in a liquid or vapor form and being at least one compound selected from the group consisting of aliphatic hydrocarbons containing 1 to 18 carbon atoms, alcohols containing 1 to 18 carbon atoms, amines containing 1 to 18 carbon atoms, organic acids and organic acid salts containing 2 to 18 carbon atoms, and combinations thereof; (b) removing substantially all functionally excessive organic composition; and (c) cycling said hydride through one or more absorption/desorption cycles between about 5 psia and about 500 psia of hydrogen at a temperature above the boiling point of said organic composition.

14. A method for improving the flow properties of a metal hydride, said hydride being an alloy, a mixture, or an intermetallic compound, each consisting essentially of metals selected from the group consisting of elements of Groups IIA, IIIA, IVB, VB, VIB, VIIB, and VIII of the Periodic Table of Elements and being capable of reversibly absorbing and desorbing hydrogen, which method comprises: (a) treating said hydride with an effective amount of an organic composition capable of imparting improved flow properties to said hydride without substantially altering said hydride's ability to reversibly absorb and desorb hydrogen, said organic composition being in a liquid or vapor form and being at least one compound selected from the group consisting of aliphatic hydrocarbons containing 1 to 18 carbon atoms, alcohols containing 1 to 18 carbon

atoms, amines containing 1 to 18 carbon atoms, organic acids and organic acid salts containing 2 to 18 carbon atoms, and combinations thereof; (b) removing substantially all excess organic composition; and (c) cycling said hydride through one or more absorption/desorption cycles between about 5 psia and about 500 psia of hydrogen at a temperature above the boiling point of said organic composition.

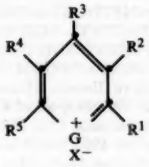
4,555,396

USE OF PYRYLIUM AND THIAPYRYLIUM COMPOUNDS AS BIOLOGICAL STAINS

David S. Frank, Rochester, and Robert T. Belly, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,260
Int. Cl.⁴ G01N *1/30*; C12Q *1/04*; C09B *57/00*
U.S. Cl. 424—3 **9 Claims**

1. In a method for distinguishing cells in a biological sample by staining with a dye, wherein the improvement comprises employing as the dye a compound of the formula



wherein

G is O or S;

R^1, R^3, and R^5 are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, amino, styryl and bis(diaryl)vinylene;

R^2 and R^4 are independently hydrogen; and

X^- is an anion.

4,555,397

METHOD FOR ANTI-CHOLINERGIC BLOCKAGE OF WITHDRAWAL SYMPTOMS IN SMOKING CESSATION

Nicholas Bachynsky, 7322 SW. Freeway, Houston, Tex. 77074

Filed Aug. 12, 1983, Ser. No. 522,858
Int. Cl.⁴ A61K *31/24, 31/44, 31/54*
U.S. Cl. 424—10 **5 Claims**

1. A method for conditioning a patient to minimize physical withdrawal symptoms associated with cessation of chronic tobacco smoking by the patient, comprising:

injecting subcutaneously into an auricular area of said patient from about 0.4 to about 1.2 cc of a solution containing a unit dosage of from about 0.1 to about 0.8 mg atropine, from about 0.2 to about 0.4 mg scopolamine, and from about 10.0 to about 50.0 mg chlorpromazine in a suitable carrier.

4,555,398

SUSTAINED-RELEASE VASODILATOR

Yoshifumi Oda, Kohchiken, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed Sep. 22, 1983, Ser. No. 534,622
Claims priority, application Japan, Oct. 5, 1982, 57-175144
Int. Cl.⁴ A61L *15/03*; A61F *13/00*; A61K *9/70*
U.S. Cl. 424—19 **6 Claims**

1. A sustained release vasodilator product in molded form which comprises (1) a vasodilating effective amount of an atoxic agent having vasodilating activity selected from at least one member of the group consisting of papaverine hydrochloride, nicardipine hydrochloride, diltiazem, cinnarizine, cyclandelate and bencyclane fumarate and (2) a member selected from the group consisting of

(a) at least one setting resin selected from the group of silicone resin, cyano-acrylate resin, epoxy resin and polyimide resin, and

(b) at least one thermoplastic resin selected from the group of polystyrene resin, polyolefin resin, polyvinyl chloride resin, cellulose acetate resin, polyamide resin, polyurethane resin and acrylic resin,

said molded product being prepared by mixing and kneading the said atoxic agent with the setting or thermoplastic resin and subsequently molding the resultant mixture.

4,555,399

ASPIRIN TABLET

Charles H. Hsiao, Cooper City, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 553,256, Nov. 18, 1983, abandoned. This application Mar. 8, 1984, Ser. No. 587,533
Int. Cl.⁴ A61K *9/28, 9/36, 31/60*
U.S. Cl. 424—35 **7 Claims**

1. A tablet that readily disintegrates in gastric fluid to give aspirin crystals coated with a polymeric film preventing the aspirin crystals from contacting the stomach wall but not preventing access of gastric fluid to the aspirin contained within the polymer film, which consists of a plurality of aspirin crystals 20–60 mesh in size coated with about 3–10% by weight of a polymeric mixture of about 1.5 to about 15 parts by weight ethylcellulose and about one part by weight hydroxypropylcellulose; a compression aid; a disintegrant; and a tableting aid.

4,555,400

SYNERGISTIC PRESERVATIVE COMPOSITIONS

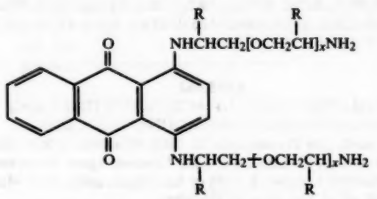
Gayle E. Borovian, Dover, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 666,023, Oct. 29, 1984, which is a division of Ser. No. 576,286, Feb. 2, 1984, Pat. No. 4,499,071, which is a division of Ser. No. 378,372, May 14, 1982, Pat. No. 4,454,146. This application Mar. 28, 1985, Ser. No. 717,737
Int. Cl.⁴ A01N *33/02, 35/02*; A61K *31/74*
U.S. Cl. 424—78 **32 Claims**

1. A preservative comprising:

(a) a first component comprising formaldehyde; and

(b) a second component having the following formula:



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wherein x is about 2 to 33 and R is H or CH_3 and mixtures thereof; and

wherein the weight ratio of said second component to said first component is 1000:1 to 1:10, the combination acting to kill or inhibit the growth of bacteria.

4,555,401

LIVE MUMPS VACCINE AND METHOD OF STABILIZING THE SAME

Hirofumi Arimura, Toyonaka; Yahiro Uemura, Hirakata, and Yoshiomi Okuno, Ibaraki, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Continuation of Ser. No. 351,401, Feb. 23, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 589,863
Claims priority, application Japan, Jul. 3, 1980, 55-90943
Int. Cl.⁴ A61K *39/165*
U.S. Cl. 424—89 **6 Claims**

1. A stable live mumps vaccine composition comprising a

live mumps vaccine and a stabilizing amount of a stabilizer consisting of albumin and gelatin.

4,555,402

PHYSIOLOGICALLY ACTIVE SUBSTANCE K-252, PROCESS FOR PRODUCING SAME AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

Yuzuru Matsuda, Koganei; Kazuyuki Iwahashi, Kunitachi; Takao Iida, Hofu; Noriaki Hirayama, Zama; Kozo Asano, Machida; Katsuichi Shuto, Shizuoka; Koji Yamada, Susono; Kunikatsu Shirahata, Komae, and Hiroshi Kase, Koganei, all of Japan, assignors to Kyowa Hakko Kogyo Co. Ltd., Tokyo, Japan

Filed Aug. 10, 1984, Ser. No. 640,159

Claims priority, application Japan, Aug. 12, 1983, 58-147471

Int. Cl.[4] A61K *35/74;* **C12P** *1/06*

U.S. Cl. 424—122 **3 Claims**

1. A physiologically active substance K-252 having the following physico-chemical properties:

State: Light yellow, columnar crystal

Melting point: 262°–273° C. (decomposed)

Specific rotation: $[\alpha]_D^{20} = -23.2°$ C. (C=0.5, $CHCl_3$)

Solubility: Readily soluble in chloroform, acetonitrile, acetone, dioxane, tetrahydrofuran and pyridine; soluble in ethanol, methanol, 1-propanol, ethyl acetate and n-butanol; insoluble in water, 2-propanol, etc.

Color reaction: Positive to reactions with each, iodine and ninhydrin; negative to reaction with ferric chloride and Rydon-Smith reaction

Ultraviolet absorption spectrum (ethanol): FIG. 1

Infrared absorption spectrum (KBr): FIG. 2

Mass Spectrum: The mass spectrum of the present substance gives the following molecule ions and fragment ions: 467, 424, 406, 364, 337, 321

Elemental analysis: H4.47, C69.08, N8.79% (as found); H4.52, C69.37, N8.98% (as calculated as $C_{27}H_{21}N_3O_5$)

PMR spectrum ($CDCl_3$): δ(ppm) 2.16 (3H, s), 2.81 (1H, dd, J=4.9, 14.2), 3.44 (1H, dd, J=7.1, 14.2), 4.08 (3H, s), 4.61 (1H, d, J=17.0), 4.69 (1H, d, J=17.0) 5.46 (1H, brs), 6.79 (1H, dd, J=4.9, 7.1) 7.0–7.6 (6H, m), 7.7–8.0 (2H, m), 8.87 (1H, d, J=7.8)

CMR spectrum ($CDCl_3$): δ(ppm) 22.8, 42.4, 45.9, 53.3, 84.9, 85.7, 99.5, 107.2, 114.2, 114.7, 116.4, 117.8, 119.3, 120.5, 120.7, 122.1, 123.9, 124.9, 125.0, 125.5, 125.8, 129.0, 132.3, 136.8, 140.3, 172.5, 173.5.

4,555,403

PHARMACOLOGICALLY ACTIVE PEPTIDES AND MEDICAMENTS CONTAINING THE SAME

Victor Brantl, Am Frauenplatz 10, 8000 München 2; Hansjörg Teschemacher, Hagstrasse 3, 6300 Giessen; Agnes Henschen, and Friedrich Lottspeich, both of Am Klopferspitz, 8033 Martinsried, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 258,617, filed as PCT DE 80/00126, on Sep. 4, 1980, published as WO 81/00712 on Mar. 19, 1981, § 102(e) date Apr. 29, 1981, Pat. No. 4,390,527.

This application Jun. 24, 1983, Ser. No. 507,807

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2936099

The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.

Int. Cl.[4] C07C *103/52;* **A61K** *37/02*

U.S. Cl. 514—17 **7 Claims**

1. Pharmacologically active peptides of the formula:

Tyr[1]-X-A

Tyr[1]-X-A-Pro

Tyr[1]-X-A-Pro-B

Tyr[1]-X-A-Pro-B-Pro

Tyr[1]-X-A-Pro-B-Pro-C

Tyr[1]-X-A-Pro-B-Pro-C-Pro

Tyr[1]-X-A-Pro-B-Pro-C-Pro-D . . .

wherein x is D-serine, D-arginine, D-methionine, D-lysine, D-phenylalanine, D-leucine, D-isoleucine, D-tryptophane or D-cystine;

A is L-proline, L-tryosine or L-phenylalanine;

B is L-proline, L-tryosine, or glycine;

C is L-proline, L-tryosine, or L-isoleucine; and

D is L-proline, L-tryosine, or L-asparagine.

4,555,404

SODIUM 7β-(2D-2-AMINO-2-CARBOXYETHYLTHIOACETAMIDO)-7α-METHOXY-3-(1-METHYL-1H-TETRAZOL-5-YL)THIOMETHYL-3-CEPHEM-4-CARBOXYLATE HEPTAHYDRATE AND PROCESS FOR ITS PREPARATION

Ken Nishihata; Katsuharu Iinuma; Hitoshi Yamada; Fumiya Hirano, and Takashi Tsuruoka, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed May 16, 1983, Ser. No. 495,236

Claims priority, application Japan, May 14, 1982, 57-80075

Int. Cl.[4] C07D *501/36;* **A61K** *31/545*

U.S. Cl. 514—201 **12 Claims**

1. Sodium 7β-(2D-2-amino-2-carboxyethylthioacetamido)-7α-methoxy-3-(1-methyl-1H-tetrazol-5-yl)thiomethyl-3-cephem-4-carboxylate heptahydrate.

4,555,405

CARBAMIC ACID ESTERS USEFUL AS PESTICIDES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

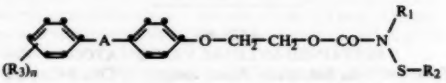
Filed Jun. 30, 1983, Ser. No. 509,498

Claims priority, application Switzerland, Jul. 2, 1982, 4054/82; Mar. 16, 1983, 1437/83

Int. Cl.[4] A01N *47/10, 37/34;* **C07C** *121/66, 125/04*

U.S. Cl. 514—488 **19 Claims**

1. A compound of the formula



wherein

R_1 is C_1–C_4-alkyl,

R_2 is phenyl, phenyl substituted by 1 or 2 halogen atoms or 1 or 2 C_1–C_4-alkyl groups, or is $—C(CH_3)_2—C{\equiv}N$,

R_3 is halogen, C_1–C_4-alkyl, or C_1–C_4-alkyl substituted by up to 3 halogen atoms,

A is oxygen or sulfur, and

n is zero, 1 or 2.

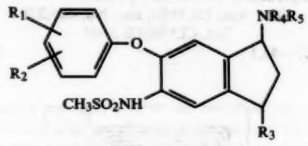
16. A method of controlling pests, selected from the group consisting of insects, and members of the order Acarina, which method comprises applying thereto or to the locus thereof a pesticidally effective amount of a compound according to claim 1.

4,555,406
INDANYL DERIVATIVES, THEIR PREPARATION AND USE

Clemens Rufer, Berlin, Fed. Rep. of Germany, and Irmgard Boettcher, Basel, Switzerland, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,629
Int. Cl.[4] A61K *31/18;* C07C *143/75*
U.S. Cl. 514—605 20 Claims

1. An indanyl derivative of the formula



wherein

R_1 and R_2 are identical or different, and each is hydrogen, flourine or chlorine

R_3 is hydrogen or phenyl

R_4 is hydrogen or alkyl of 1–6 carbon atoms, and

R_5 is hydrogen, alkyl of 1–6 carbon atoms, cyclohexyl or phenyl

with the proviso that at least one of the substituents R_3, R_4, and R_5 is different from hydrogen, or a physiologically acceptable salt thereof with an acid.

4,555,407
CONTINUOUS CHEWING GUM METHOD

Franklin Kramer, Briarcliff Manor, N.Y.; Henderikus B. Bruins, Cream Ridge; Joseph Giacone, Princeton Junction, both of N.J., and Luc L. Carbillet, Buc, France, assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,049
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—5 14 Claims

1. A method for continuously forming a wide thin chewing gum slab suitable for forming sheets and bands ready for packaging in an automatic wrapping machine which comprises:

(a) continuously compounding a chewing gum paste;

(b) extruding the formed gum paste to a slab at least 0.7 meters wide and less than 3 mm thick, said extruded slab having a temperature less than 100° C.;

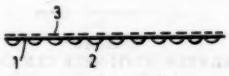
(c) cooling the extruded gum paste slab to a temperature less than about 60° C. in less than about 60 seconds; and

(d) passing the gum paste slab through calender rolls to reduce the slab to less than 2.5 mm thick.

4,555,408
SAUSAGE

Barbara Gregor, Moorrege, and Gebhard Huckfeldt, Tornesch, both of Fed. Rep. of Germany, assignors to Huckfeldt & Thorlichen, Tornesch, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,671
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3333387
Int. Cl.[4] A23L *1/31*
U.S. Cl. 426—90 8 Claims

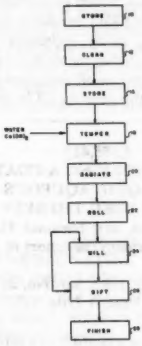


1. A sausage containing sausage meat and having an artificial sausage casing of two-dimensional fiber material, said casing being rough on the inside and containing an impregnation or coating of collagen and a separate impregnation of fat, oil or wax, and wherein the roughness on the inside of said casing is formed by still fibers or filaments which are positively anchored in the surface of the sausage meat.

4,555,409
CEREAL PROCESSING

Edwin R. Hart, Box 5184, Richardson, Tex. 75080

Filed Apr. 9, 1984, Ser. No. 598,079
Int. Cl.[4] A21D *6/00;* A23L *1/10*
U.S. Cl. 426—242 4 Claims



1. A method of making masa from cereal grains comprising:

a. cleaning the grains,

b. tempering the grains by adding water until they have a moisture content of about 30% by weight,

c. rapidly heating the tempered grains by radiating the grains with infrared radiation until the grains are uniformly partially gelatinized, then

d. flaking the grains immediately after heating by rolling the grains through rolls while the grains are soft and turgid, and then

e. grinding the grains to a flour.

4,555,410
PROCESS FOR THE PRODUCTION OF CONTROLLED FREEZING POINT DRIED FOODS

Akiyoshi Yamane, 577-1, Yonehara, Yonago-Shi, Tottori Prefecture, Japan

Filed Aug. 23, 1983, Ser. No. 525,678
Claims priority, application Japan, Aug. 31, 1982, 57-150015
Int. Cl.[4] A23C *1/08;* A23L *3/36*
U.S. Cl. 426—384 2 Claims

1. A process for the production of controlled freezing point dried food having its original freshness and having an excellent restoration ability to its original state, which comprises treating a fresh food to be dry-treated in the presence of an edible freezing-point depression agent at a temperature of 0° C. or below for at least 10 hours without freezing said fresh food to thereby make the food cold-resistant, to maintain its original freshness and to improve its flavor and taste and blowing chilled air at a temperature of −5° C. to −10° C. onto the food at a stream rate of 0.5 m/sec to 5 m/sec for 5 to 600 hours to freeze dry said food and thereby form a freeze-dried food.

4,555,411

PROCESS FOR PRODUCING A REDUCED FAT SPREAD

David P. J. Moran, Covington; John J. Hepburn, Milton Ernest, and David G. Sharp, Clapham, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 7, 1983, Ser. No. 511,407

Claims priority, application United Kingdom, Jul. 8, 1982, 8219845; Netherlands, Oct. 18, 1982, 8204009

Int. Cl.[4] A23D *3/02*

U.S. Cl. 426—603 7 Claims

1. A process for producing a water-in-oil emulsion spread having a fat content of at most 60%, comprising

(i) providing an oil-in-water emulsion from a fatty phase and an aqueous phase at a temperature at which the fatty phase is melted, said emulsion being a dairy cream which is substantially free from added emulsifiers;

(ii) shearing and cooling said emulsion in the absence of a cream/air interface, using apparatus means internally coated with a hydrophobic material, to cause phase inversion and obtain a water-in-oil emulsion-spread having the same level of fat as the starting oil-in-water emulsion.

4,555,412

PROCESS FOR APPLYING A COATING TO A SUBSTRATE AND A LIQUID AQUEOUS COMPOSITION TO BE USED THEREIN

Gerhard Günter, Ettlingen, and Hartmut Haeufler, Aldingen, both of Fed. Rep. of Germany, assignors to Akzo nv, Arnhem, Netherlands

Filed Mar. 15, 1982, Ser. No. 357,819

Int. Cl.[4] B05D *1/04, 3/02*

U.S. Cl. 427—27 14 Claims

1. A process for applying a coating to a substrate by bringing the substrate into contact with an aqueous coating composition at a temperature in the range of 5° to 65° C., so that a coating of the coating composition is formed on the substrate, said coating being subsequently cured at a temperature in the range of 70° to 220° C., characterized in that the coating composition comprises a dispersion of an epoxy compound that is essentially a solid epoxy group-containing compound having a number average molecular weight of at least 1000, an epoxy equivalent weight in the range of 450 to 7500 and an average particle size of about 0.5 to 35 μm and a melting point between 40° C. and the baking temperature, in an aqueous medium comprising an ionized polyamino compound having primary or secondary amino groups as curing agent for the epoxy group-containing compound, the ratio of the number of reactive groups of the polyamino compound to the number of epoxy groups of the epoxy compound being at least 0.4.

4,555,413

PROCESS FOR PREPARING H_2 EVOLUTION CATHODES

Dale E. Hall, Wilton, Conn., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Aug. 1, 1984, Ser. No. 636,707

Int. Cl.[4] B05D *1/00, 1/08*

U.S. Cl. 427—34 6 Claims

1. A process for producing a hydrogen evolution cathode comprising spraying particles of a powder containing an AB_N intermetallic compound wherein A is at least one member of the group consisting of rare earth elements and calcium and up to 0.2 atom of zirconium and/or thorium, B is selected from the group of nickel and cobalt and up to 1.5 atom in total of aluminum, copper, tin, iron and chromium and N has a value between 4 and 8, through an energetic medium onto a metallic substrate characterized by corrosion resistance in aqueous alkaline media, the duration of the spray passage and the temperature of said medium being such that particles of said powder are at least partly molten at time of impact with said substrate, and thereafter subjecting the thus sprayed substrate to a reduction at a temperature up to about 650° C. to reduce the coating on said substrate.

2. A process as in claim 1 wherein the energetic medium is a plasma.

4,555,414

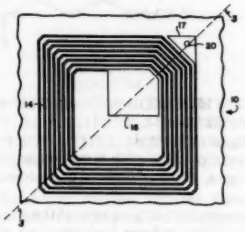
PROCESS FOR PRODUCING COMPOSITE PRODUCT HAVING PATTERNED METAL LAYER

Merwin F. Hoover, Topsfield; Ann B. Salamone, Marblehead, and Jan Vandebult, Topsfield, all of Mass., assignors to Polyonics Corporation, Newburyport, Mass.

Filed Apr. 15, 1983, Ser. No. 485,328

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—43.1 29 Claims



1. The process for forming a composite product which comprises applying directly to a base a patterned layer of curable resin, curing said resin in said pattern, etching said patterned cured resin in the absence of a mask with an etchant which will permit absorption onto said patterned cured resin of a metal catalyst capable of promoting electroless metal deposition selectively but which will not chemically modify said base so as to permit absorption onto said base of a metal catalyst capable of promoting electroless metal deposition selectively, contacting said etched cured resin with a catalyst composition capable of promoting electroless metal deposition on said etched cured resin without effecting, absorption of said catalyst on said base, activating the absorbed catalyst, and electrolessly depositing a metal layer on said etched cured patterned resin selectively without effecting electroless deposition of said metal layer on the base.

4,555,415

VITREOUS ENAMELS

John L. C. Mumford, Saffron Walden, and Roger F. Price, Haverhill, both of England, assignors to TI (Group Services) Limited, Birmingham, England

Filed Dec. 19, 1984, Ser. No. 683,617

Claims priority, application United Kingdom, Dec. 21, 1983, 8334118

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—193 15 Claims

1. A process for applying a vitreous enamel comprising; applying a powdered vitreous frit to a metal, said vitreous frit having a water content of up to 0.03% by weight; and then firing the coated metal at a temperature in excess of the melting point of the frit, in a furnace having an atmosphere with a dew point of up to 10° C.

4,555,416

SPRAY APPARATUS WITH SELF CLEANING NOZZLE

Michael L. Fights, and William E. Jones, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Aug. 27, 1984, Ser. No. 644,490

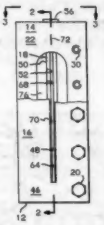
Int. Cl.[4] C23C *16/00*

U.S. Cl. 427—248.1 36 Claims

1. A method for spraying a first fluid through a first nozzle,

and for cleaning said first nozzle without removing said first nozzle from a spray apparatus, which method comprises:

(a) interposing a chamber between said first nozzle and a supply port;



(b) inserting a second nozzle into said chamber;

(c) supplying said first fluid to said supply port; and

(d) directing a second fluid through said second nozzle, and through said first nozzle.

4,555,417

METHOD FOR COATING A SUBSTRATE WITH A FOAMED PROTEINACEOUS PRODUCT

Paul W. Gibson, Mt. Zion, and Frank T. Orthoefer, Decatur, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Division of Ser. No. 174,307, Jul. 30, 1980, Pat. No. 4,390,450. This application Apr. 8, 1983, Ser. No. 470,836

Int. Cl.[4] B05D *3/12, 7/24*

U.S. Cl. 427—361 **4 Claims**

1. In an improved method for preparing a substrate coated with a proteinaceous foaming composition wherein an aqueous medium containing a proteinaceous foaming component is ingested with a sufficient amount of a gas to provide a foamed product, a substrate is coated with foamed product and the foamed product is mechanically disintegrated to form a continuous surface coating upon said substrate, the improvement which comprises ingesting gas into an aqueous medium containing a proteinaceous foaming composition consisting essentially of at least one proteinaceous foaming component selected from the group consisting of vegetable protein hydrolyzate having at least two different chelating sites, egg albumen, and casein hydrolyzate, at least 0.005 mole alkaline earth metal ions for each mole of nitrogen in said proteinaceous component and at least 0.002 mole zinc ions for each mole of nitrogen in said proteinaceous component.

4,555,418

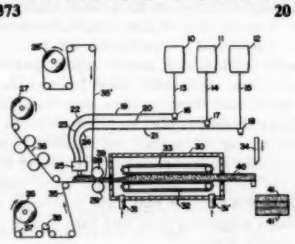
ALKOXYLATED AROMATIC AMINE-AROMATIC POLYESTER POLYOL BLEND AND POLYISOCYANURATE FOAM THEREFROM

Scott C. Snider, Pinellas Park, and Alberto DeLeon, Clearwater, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 541,197, Oct. 12, 1983, Pat. No. 4,496,625. This application Dec. 17, 1984, Ser. No. 682,119

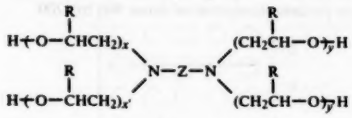
Int. Cl.[4] C08G *18/14, 18/32, 18/42;* **C09K** *3/00*

U.S. Cl. 427—373 **20 Claims**



1. A polyisocyanurate foam comprising the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol blend comprising

(a) about 5 percent to about 95 percent by weight of said blend of an alkylene oxide adduct of an aromatic amine of the formula



wherein Z is a divalent aromatic radical, x, x', y, and y' each independently have an average value from about 1 to about 5, and each R is independently selected from the group consisting of hydrogen, alkyl or aryl, provided that the adduct is capped with ethylene oxide units, and

(b) about 5 percent to about 95 percent by weight of said blend of an aromatic polyester polyol having a molecular weight of from about 150 to about 5,000.

4,555,419

METHOD OF IMPREGNATING TEXTILE MATERIALS MADE FROM ORGANIC FIBERS

Karl Huhn, Burghausen, Fed. Rep. of Germany, and Günter von Au, Sao Paulo, Brazil, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 627,125

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3332997

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—387 **9 Claims**

1. A method for impregnating textile materials made from organic fibers which comprises impregnating the textile materials with a composition containing a crosslinkable diorganopolysiloxane, an organopolysiloxane having at least 3 Si-bonded hydrogen atoms per molecule, a crosslinking catalyst, and an organo(poly)siloxane having 1 or 2 Si-bonded hydrogen atoms and from 2 to 8 silicon atoms per molecule in which the composition is free of a filler having a surface area greater than 50 g/m^2 in an amount greater than 1 weight percent based on the weight of the organosilicon compounds and thereafter crosslinking the corsslinkable diorganopolysiloxane.

4,555,420

CURABLE SILICONE COMPOSITIONS AND PROCESSES

Gary M. Lucas, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 5, 1984, Ser. No. 627,954

Int. Cl.[4] C08G *77/04, 77/06;* **C08K** *3/36, 3/26*

U.S. Cl. 427—387 **38 Claims**

1. A low modulus room temperature vulcanizable silicone composition substantially free of plasticizer consisting essentially of:

(A) 100 parts by weight of an organopolysiloxane wherein the silicon atoms at the polymer chain ends are terminated with at least two alkoxy radicals, said organopolysiloxane having a viscosity ranging from about 20,000 centipoise to 500,000 centipoise at 25° C., and

(B) at least 0.1 part by weight of at least one silane having the formula

Z_2SiX_2

where X is an amino radical, amido radical or aminoxy radical, or mixture of such radicals, and Z is a substituted or unsubstituted hydrocarbon radical or mixture thereof; with the proviso that the cured composition has an ultimate percent elongation of about 500 to 1200.

4,555,421

FILLING MATERIAL

Kazo Yasue, Utsunomiya, Japan, assignor to Anmin Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 128,468, Mar. 7, 1980. This application May 11, 1984, Ser. No. 609,905

Claims priority, application Japan, May 23, 1979, 54-63546

Int. Cl.⁴ A41G *11/00*

U.S. Cl. 428—6 **16 Claims**

1. A filling material which simulates feathers and which is composed of a plurality of resilient fibers of an elongated, substantially cylindrical bundle of fibers, at least some of the fibers having different lengths, said fibers being bent into a loopy configuration wherein the center of the loopy configuration is large in comparison to the diameter of the bundle of fibers, the opposite ends of said fibers being gathered at one point and bonded together at the one point such that there are substantially no free fiber ends and wherein some of the fibers bent into the loopy configuration have different angular orientation of the loopy configurations formed thereby such that the filling material is substantially three dimensional.

4,555,422

HEAT SHRINKABLE MAGNETIC SHIELDING ARTICLE

Koichi Nakamura, Numazu; Masashi Ishibashi, Chiba; Hideki Kameda, Yachiyo, and Minoru Makiyo, Inba, all of Japan, assignors to Fujikura Ltd, Tokyo, Japan

Filed Jan. 10, 1984, Ser. No. 569,634

Claims priority, application Japan, Jan. 15, 1983, 58-004755

Int. Cl.⁴ F16L *00/00*

U.S. Cl. 428—36 **14 Claims**

1. A heat shrinkable magnetic shielding article which comprises:

a heat shrinkable layer comprising a thermoplastic polymeric material;

and, arranged under the layer, directly or via an adhesive layer, a magnetic shielding layer comprising a thermoplastic polymeric material and at least one powdery ferrite selected from the group consisting of $MnO.Fe_2O_3$, $FeO.Fe_2O_3$, $CoO.Fe_2O_3$, $NiO.Fe_2O_3$, $CuO.Fe_2O$ and $ZnO.Fe_2O_3$,

said magnetic shielding layer being heat shrinkable or being adapted to flow due to the force exerted by shrinkage of the heat shrinkable layer,

said ferrite being contained in the magnetic shielding layer in an amount of from 10 to 90% based on the total weight of the layer.

4,555,423

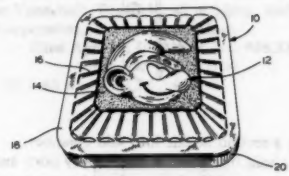
MULTICOLORED UNITARY THERMOFORMED ARTICLE

Howard E. Sands, Broadalbin, N.Y., assignor to Coleco Industries, Inc., West Hartford, Conn.

Filed Jun. 25, 1984, Ser. No. 624,452

Int. Cl.⁴ B44C *5/04*

U.S. Cl. 428—79 **8 Claims**



1. A unitary multicolored thermoplastic article including a body element and a substantially continuous contoured insert element of sheet-like nature on one surface of said body element and of lesser dimension than said body element so as to provide an exposed peripheral portion about said insert element, said insert element being preformed with at least two discrete depths providing a layer above said one surface of said body element and being differentially colored with respect thereto, said insert and body elements being bonded together and having a multiplicity of complimentary contours of at least two discrete depths in the area of said insert element to provide a first design component, said body element having a multiplicity of additional contours in said peripheral portion of at least two discrete depths.

4,555,424

TEXTILE SHEET WITH SURFACE EFFECTS

Ingeborg Reim, Cottbus; Gerhard Pohl, Forst; Wolfgang Götzke, Forst; Dieter Wahnberger, Forst; Lothar Postel, Forst; Irmgard Kindlein, Forst; Rudolf Vatter, and Manfred Greschke, both of Cottbus, all of German Democratic Rep., assignors to VEB Forst, Lausitz, German Democratic Rep.

Filed Feb. 24, 1984, Ser. No. 582,985

Int. Cl.⁴ B32B *5/06*

U.S. Cl. 428—91 **15 Claims**

1. A finished textile sheet having surface effects including one or more of threads with a high degree of hairiness, a larger volume of the yarn, a nap (at low material losses) on one or both surfaces, a loosening of the yarn structure, lower fiber volume per square centimeter, a higher volume, a softer touch, a warmer surface effect, increased tenacity and hairiness, and a higher sheet volume, which comprises a product textile sheet having at least one specific surface effect, and being derived from an initial textile sheet, said initial textile sheet including yarns or threads of strengths typical for carded yarns, and having a firm round yarn cross-section and low or minimal hairiness, stomach binder, and/or sugartop effects, said yarns or threads of said initial textile sheet having a mantle and fibers or fiber parts, said fibers or fiber parts being displaced from said yarns or threads as fiber ends and/or loops, and penetrating and extending into at least one surface of said initial textile sheet, said fibers or fiber parts being displaced at least partially through the entire thickness of said initial textile sheet, and filling the spaces between said yarns or threads, said fiber ends and/or loops projecting from said yarn mantle as hairs in said product textile sheet.

4,555,425

TEXTILE SHEET WITH SPECIFIC SURFACE EFFECTS

Ingeborg Reim, Cottbus; Gerhard Pohl, Forst; Wolfgang Götzke, Forst; Dieter Wahnberger, Forst; Lothar Postel, Forst; Irmgard Kindlein, Forst; Rudolf Vatter, and Manfred Greschke, both of Cottbus, all of German Democratic Rep., assignors to VEV Forster Tuchfabriken, Forst, German Democratic Rep.

Filed Feb. 24, 1984, Ser. No. 582,986
Int. Cl.[4] B32B 5/06
U.S. Cl. 428—91 20 Claims

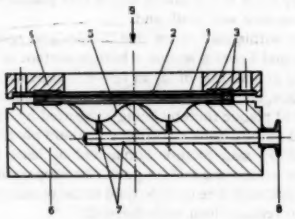
1. A finished textile sheet article having specific surface effects including one or more of surface stability, pattern and needleloom felt character, fulling and raising-like effects, high hairiness, loose cross-section, high wool portion of the yarn, fulling-like fiber displacements, and a nap on the surface, which comprises a finished textile sheet having a high wool portion, said finished textile sheet having at least one specific surface effect, and being derived from an initial textile sheet having a predominantly low wool portion and including yarns or threads of yarn or thread strengths typical for carded yarns, and having a firm round yarn cross-section, and low hairiness, the surface of said initial textile sheet being penetrated by wool fiber portions, said wool fiber portions extending at least partially through the entire thickness of said initial textile sheet, so that said yarns or threads are penetrated with fibers from said wool fiber portions.

4,555,426

PREFORMED, LAMINATED PLASTIC PANELS

Siegfried Roth, Salem, and Horst Stenzenberger, Schriesheim, both of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen and Technochemie GmbH-Verfahrenstechnik, Dossenheim, both of, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,365
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1982, 3243021
Int. Cl.[4] B32B 5/12
U.S. Cl. 428—113 3 Claims



1. A preformed, rigid, laminated plastic panel comprising a plurality of individual rigid, unfoamed, non-porous laminated thermoplastic layers or thermoplastic layers arranged in partly differing orientation reinforced with unidirectionally preoriented short fibers comprising 20 to 80% of the layer volume.

4,555,427

HEAT TRANSFERABLE SHEET

Sadanobu Kawasaki, Tokorozawa; Mineo Yamauchi, Ichikawa, and Masanori Akada, Tokyo, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

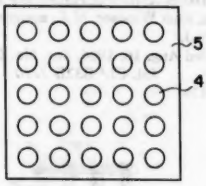
Filed Jul. 23, 1984, Ser. No. 633,435
Claims priority, application Japan, Jul. 25, 1983, 58-135627
Int. Cl.[4] B41M 3/12; D06P 1/41, 5/00
U.S. Cl. 428—195 7 Claims

1. A sheet to be heat transfer printed which is to be used in combination with a heat transfer printing sheet, and which has a receptive layer for receiving a dye transferred from the heat transfer printing sheet upon being heated, said receptive layer comprising first and second regions characterized in that:

(a) the first region is formed from a synthetic resin having a glass transition temperature of from −100° to 20° C. and having a polar group;

(b) the second region is formed from a synthetic resin having a glass transition temperature of 40° C. or above;

(c) both the first region and the second region are exposed at the surface of the receptive layer, the first region occupying at least 15% of said surface; and



(d) the first region exists in the form of mutually independent islands and the respective longitudinal length of the island-like portions is from 0.5 to 200 μm.

4,555,428

MULTI-LAYER UNITIZED FABRIC CONSTRUCTION AND METHOD OF MAKING SAME

Tyler L. Cole, Asheboro, N.C., assignor to Stedman Corporation, Asheboro, N.C.

Filed Apr. 13, 1982, Ser. No. 367,927
Int. Cl.[4] B32B 3/06
U.S. Cl. 428—102 11 Claims

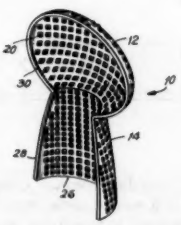
1. A multi-layer unitized fabric construction comprising a single layer of shell fabric having a single fusible liner layer adhered thereon to form a composite layer folded on itself to form top and bottom shell fabric layers and two opposed layers of fusable lining therebetween and a permanent adhesive layer interposed between the two opposed layers of fusible lining with all of the layers being adhered together to form a single unitized structure.

4,555,429

CURVED NEEDLEPOINT CANVAS

Richard A. Martin, Tarrytown, N.Y., assignor to Dick Martin Design, Ltd., Tarrytown, N.Y.

Filed Jun. 21, 1984, Ser. No. 622,973
Int. Cl.[4] D03D 29/00
U.S. Cl. 428—131 18 Claims



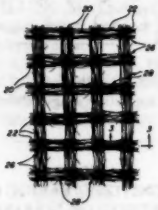
1. A needlepoint canvas comprising a curved perforated plastic sheet having, when in upright orientation, a mushroom shape cut by a central vertical plane, said mushroom shape comprising a generally oval head part whose major axis is horizontal and a generally cylindrical base part having a bottom end diameter less than the horizontal breadth of said head part and a top end diameter less than said bottom end diameter.

4,555,430

ENTANGLED NONWOVEN FABRIC MADE OF TWO FIBERS HAVING DIFFERENT LENGTHS IN WHICH THE SHORTER FIBER IS A CONJUGATE FIBER IN WHICH AN EXPOSED COMPONENT THEREOF HAS A LOWER MELTING TEMPERATURE THAN THE LONGER FIBER AND METHOD OF MAKING SAME

Alfred T. Mays, East Windsor, N.J., assignor to Chicopee, New Brunswick, N.J.

Filed Aug. 16, 1984, Ser. No. 641,144
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—134 14 Claims



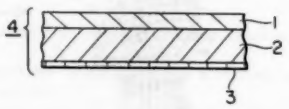
1. A strong durable nonwoven fabric comprising base fibers and conjugate fusible fibers of shorter length than said base fibers, and having a low melting point component and at least one high melting point, said fibers being arranged in a network of entangled fiber areas of higher density than the average density of the fabric, and interconnecting fiber bundles, the fibers of said interconnecting fiber bundles extending between and are entangled within the entangled fiber areas, said shorter length conjugate fibers being concentrated in said entangled fiber areas, and thermobonded to each other at fiber intersections to reinforce and strengthen the fabric, especially in said entangled fiber areas.

4,555,431

MAGNETIC RECORDING MEDIUM

Hajime Miyatsuka, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 6, 1984, Ser. No. 576,990
Claims priority, application Japan, Feb. 4, 1983, 58-16243
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—141 18 Claims



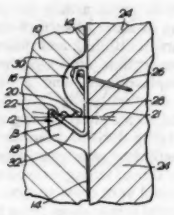
1. A magnetic recording medium comprising a magnetic layer on one side of a non-magnetic support and a back layer on the other side thereof, in which the magnetic layer consists mainly of a ferromagnetic metal powder and a binder and has a coercive force of at least 1000 Oe and a surface roughness of at most 0.03 μm, the ferromagnetic powder having a specific surface area of at least 35 m^2/gr and a saturation magnetization of at least 120 emu/gr, while the back layer has a surface electric resistance of at most $1 \times 10^{10}\Omega$ and a surface roughness of at most 0.05 μm.

4,555,432

WALL PLAQUES

William R. Bossons, Congleton, England, assignor to W. H. Bossons (Sales) Limited, England

Filed Aug. 15, 1984, Ser. No. 640,943
Claims priority, application United Kingdom, Aug. 18, 1983, 8322189
Int. Cl.[4] B44C *5/04*
U.S. Cl. 428—156 5 Claims



1. A wall plaque adapted to be hung on a wall by a picture hook, said picture hook being of the type having an upturned V-shaped hook portion connected by a strap to a crown shaped head portion, said picture hook being mountable on a wall by a nail driven through said head portion, said wall plaque comprising

an intermediary body portion having a front face and a rear face,

structure defining a recess in said rear face, said recess having an upper portion sized to receive said hook's head portion, and having a lower portion sized to receive said hook's hook portion, said hook's head and hook portions being received in said recess's upper and lower portions, respectively, when said plaque is hung on a wall by said picture hook in a position where said plaque's rear face is flush against said wall, and

a tongue within said recess that divides said recess into said upper and lower portions, a bottom surface of said tongue having at least one of (a) an upward slope away from said rear face, and (b) a plurality of ribs, said tongue resting on, and said plaque thereby being supported by, the free edge of said picture hook's portion when said plaque is hung on a wall by said picture hook, and at least one of said tongue's slope and said tongue's ribs cooperating with said hook portion's free edge to tend to cause said plaque's rear face to remain flush with the wall.

4,555,433

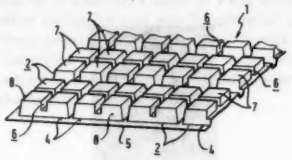
SOUND-ABSORBING ELEMENT

Dieter Jablonka; Klaus Urban, both of Herdecke; Heinz-Peter Raidt, Dortmund, and Eberhard Schepers, Herdecke, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich and Ewald Dörken AG, Herdecke, both of, Fed. Rep. of Germany

Filed Sep. 9, 1983, Ser. No. 530,640
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233654
Int. Cl.[4] B32B *3/30*; E04B *1/84*
U.S. Cl. 428—166 15 Claims

1. A sound-absorbing element comprising a plurality of cup-shaped recesses being covered by a flat web, each of said cup-shaped recesses having a bottom surface consisting of a film, said bottom surfaces being directly exposed to a sound field during installation and the size of said bottom surfaces being such that they are excitable to a plurality of natural vibrations upon the incidence of sound at a plurality of frequencies, each of said bottom surfaces being subdivided by at least one crimp-shaped recess into bottom subsurfaces, the depth of said crimp-shaped recess is appreciably smaller than

the depth of said cup-shaped recesses, and said crimp-shaped recess extends from one side of one said bottom surface to the



other side thereof and separates said subsurfaces completely from one another.

4,555,434

ANTI-GLARE GLASS PANE FOR A VEHICLE

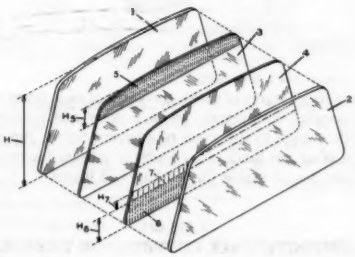
Heinz Kunert, Cologne, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Aubervilliers, France

Continuation-in-part of Ser. No. 149,983, May 15, 1980, abandoned. This application Sep. 30, 1983, Ser. No. 537,673

Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920363; Sep. 5, 1979, 2935822

Int. Cl.⁴ B32B *3/02, 17/10;* **H05B** *3/10*

U.S. Cl. 428—194 **9 Claims**



1. Anti-glare glass pane for a windshield of a vehicle having a front hood where said pane has a main area of a field of vision and a secondary area of a field of vision beneath said main area and which is less transparent than said main area; characterized in that a lower portion of the secondary area is in the shape of a downwardly curved concave band having an upper substantially center portion extending upwardly towards the top of the pane and lower side portions curved downwardly towards the bottom and both sides of the pane, in that the degree of transparency of the secondary area increases gradually from the bottom thereof towards the top, in that said lower portion of the secondary area has light transmission of the visable spectrum in the range of 30 to 50%, in that an upper portion of the secondary area positioned between the bottom portion and the main area of vision has a light transmission of the visible spectrum in the range of 50–80%, and in that said upper portion is positioned along a line of sight adapted to extend from the eye level of the operator of the vehicle to an area of a roadway 10–20 m ahead of the vehicle.

4,555,435

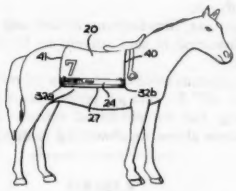
INTERCHANGEABLE IDENTIFICATION APPARATUS FOR RACING ANIMALS AND EVENT CONTESTANTS AND METHOD FOR MAKING SAME

Ernest J. Walter, 2913 Caldwell Ave., Ontario, Calif. 91761

Filed Jan. 30, 1984, Ser. No. 575,078

Int. Cl.⁴ B68C *1/12;* **G09F** *3/08, 7/08*

U.S. Cl. 428—79 **10 Claims**



1. A labelling apparatus with detachable label for providing spectator identification of animals comprising:

a flexible label having an upper surface for carrying information thereon, a lower surface, and a first and second end;

a carrier piece into which said label is attached and displayed, said carrier piece having an upper surface and a lower surface, and having at least one slot for receiving at least an end of said label and for passing said end therethrough, whereon said slot is disposed to provide upward support of said label and to provide for cooperative interface between the surface of said carrier piece and said label such that said label is urged against the surface of said carrier piece and the body of said animal by gravity and rider weight forces present thereon; a first fastening means for detachably securing said upper surface of said end to said lower surface of said carrier piece; and

a second fastening means for removably securing said lower surface of said label to said upper surface of said carrier piece;

whereby said label is maintained flush and aligned with said carrier piece, and whereby said label is detachably secured thereto.

4,555,436

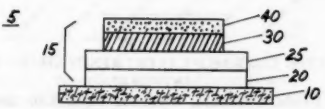
HEAT TRANSFERABLE LAMINATE

Friedrich H. H. Geurtsen, Holliston; John M. Anemaet, Millis; Donald R. Smith, Hingham, and Mary G. Boyd, Framingham, all of Mass., assignors to Dennison Manufacturing Co., Framingham, Mass.

Filed May 3, 1984, Ser. No. 606,747

Int. Cl.⁴ B32B *7/06;* **C09J** *7/02, 7/04*

U.S. Cl. 428—200 **17 Claims**



1. In a heat transferable laminate of the type including a carrier support and a solvent-based release layer coated onto the carrier support and wherein the solvent-based release layer is dried to evaporate the solvent contained therein and an ink design layer applied over the dried release layer forming a heat transferable substrate comprising the dried release layer and ink design layer, the substrate transferable from the carrier support to a receiving article upon application of heat to the carrier while said receiving article contacts the transferable substrate, an improved solvent-based release composition prior to drying comprising:

a oxidized, esterified, partially saponified montan wax component;

a film-forming binder comprising a thermoplastic resin selected from the group consisting of a rosin ester and a hydrocarbon resin, said rosin ester comprising pentaerythritol ester of rosin and said hydrocarbon resin comprising the product resulting from polymerization and hydrogenation of hydrocarbon monomer.

a plasticizer-binder comprising ethylene vinyl acetate copolymer; and

a liquid solvent;

the montan wax, film-forming binder and plasticizer binder being dissolved in said solvent to form a homogeneous solution,

said homogeneous solution having a gel point temperature of less than 140° F., said gel point temperature achieved by subjecting the solvent-based release composition to a temperature above its dissolving temperature.

4,555,437

TRANSPARENT INK JET RECORDING MEDIUM

Elinor J. Tanck, Cupertino, Calif., assignor to Xidex Corporation, Sunnyvale, Calif.

Filed Jul. 16, 1984, Ser. No. 631,282
Int. Cl.[4] B41M *5/00*
U.S. Cl. 428—212 **19 Claims**

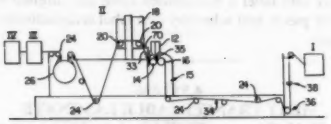
1. A transparent recording sheet comprising a transparent base support coated with a transparent ink-receiving layer comprising a hydroxyethylcellulose.

4,555,438

FRAGRANT WALL COVERING HAVING AN EMOLLIENT MOISTURIZER AND A METHOD OF MAKING SAME

John E. Orsak, Sparta, N.J., and Charles A. Roman, Conyngham, Pa., assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 14, 1985, Ser. No. 711,690
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—219 **27 Claims**



1. In a wall covering comprising a polymeric exterior decorative surface layer and an inside surface of said wall covering, the improvement comprising a fragrant polymer entrapped emollient-moisturizer composition incorporated substantially uniformly in said polymeric layer, said fragrant emollient-moisturizer composition being gradually released into the atmosphere over an extended period of time.

4,555,439

TOUGH THERMOPLASTIC RESIN SHEET-LIKE MATERIAL

Ryuhei Ueeda, Kurashiki; Kiyonobu Fujii, Kibi, and Hiroshi Narukawa, Soja, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Jan. 13, 1984, Ser. No. 570,295
Claims priority, application Japan, Jan. 21, 1983, 58-9169
Int. Cl.[4] B32B *7/02, 27/09;* B28B *3/00*
U.S. Cl. 428—221 **10 Claims**

1. A pressed sheet like material characterized in that whitening is not found in the superficial layer upon electron microscope scanning, comprising:

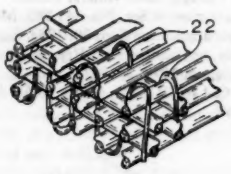
(1) a thermoplastic resin having a degree of crystallinity of 10% or more and present in amounts of 20 to 90% by weight, and (2) flaky fillers of 10 to 80% by weight, the degree of orientation of crystals in the crystal plane parallel to the molecular chain of said resin being 55% or more; the percentage change in thickness of said sheet-like material being 2% or less; said sheet-like material being further characterized by the fact that it is pressed and has a notched Izod impact strength which is 2 or more times that of unpressed sheet-like material and a toughness which is 1.5 or more times that of unpressed sheet-like material.

4,555,440

MULTILAYERED PRESS FELT

Robert L. Crook, Saratoga Springs, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Jan. 2, 1985, Ser. No. 688,303
Int. Cl.[4] B32B *7/08*
U.S. Cl. 428—223 **19 Claims**



1. A press felt comprising:

a plurality of layers of yarns, the yarns of each layer oriented in parallel with respect to each other and perpendicular with respect to the yarns of adjacent layers, the yarns of one layer not binding the yarns of adjacent layers; and

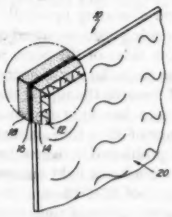
separate binder means for binding said layers.

4,555,441

SELF-ADHESIVE WALL COVERING OR THE LIKE AND METHOD OF MAKING SAME

Irwin P. Rothenberg, Oceanside, N.Y., assignor to Stik-Trim Industries, Incorporated, New York, N.Y.

Filed Mar. 6, 1985, Ser. No. 708,674
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—284 **9 Claims**



1. A self-adhesive wall covering or the like that is easily

removable from a wall, consisting essentially of a layer of fabric having a visible pattern on one surface thereof; an acrylic-saturated paper having one surface adhesively fixed to the other surface of said fabric; a layer of PVA adhesive coated onto the other surface of said acrylic-saturated paper; and a layer of release paper removably secured to said PVA adhesive such that when said release paper is removed to expose said PVA adhesive, the wall covering is adherable to a wall by means of the exposed PVA adhesive.

4,555,442

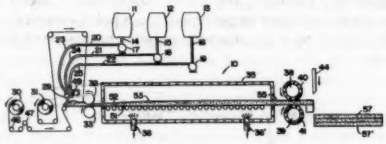
POLYOXYALKYLENE/UNSATURATED DIESTER REACTION PRODUCT FOR CELLULAR FOAM STABILIZATION

Richard L. Frentzel, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 663,627, Oct. 22, 1984, Pat. No. 4,520,140, which is a division of Ser. No. 544,301, Oct. 21, 1983, Pat. No. 4,481,307, which is a division of Ser. No. 426,581, Sep. 29, 1982, Pat. No. 4,418,158, which is a division of Ser. No. 282,322, Jul. 10, 1981, Pat. No. 4,365,024. This application Apr. 11, 1985, Ser. No. 722,248

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—318.4 **18 Claims**



1. A laminated structural panel having at least one facing sheet and having a foam material adhering to the facing sheet wherein the foam material comprises the reaction product of:

A. polymer forming reactants selected from the group consisting of phenolic, polyisocyanurate and polyurethane polymer forming reactants,

B. a blowing agent, and

C. a surfactant which comprises the reaction product of

(a) a polyoxyalkylene adduct having the formula

H—polyoxyalkylene chain R,

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R, and

(b) an esterified unsaturated dibasic acid having the formula

$T^1O_2C—C_uH_{2u-2}—CO_2T^2$

wherein u is 2 or 3 and T^1 and T^2 are identical or different and represent a straight or branched, saturated or unsaturated hydrocarbon chain, in the presence of an effective amount of a free-radical initiator, and wherein the polyoxyalkylene adduct optionally is capped by treatment either before or after its reaction with the esterified unsaturated dibasic acid with a capping agent capable of reacting with the hydroxyl groups of said adduct to reduce the hydroxyl number of said adduct to less than 50.

4,555,443

MAGNETIC RECORDING MEDIUM

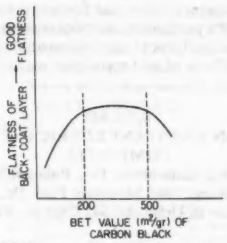
Shozo Kikugawa, and Yoshitaka Yasufuku, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,097

Claims priority, application Japan, Jun. 30, 1983, 58-118881

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—336 **27 Claims**



1. A magnetic recording medium comprising a support having a magnetic layer on a first side of said support and a back coat layer on a second side of said support which second side is opposite said first side, said back coat layer containing at east a silicon-modified polyurethane and a carbon black having a BET value of from 200 to 500 m^2/g, said silicon-modified polyurethane being obtained by the reaction of an isocyanate and an active hydrogen compound having a siloxane linkage.

4,555,444

MAGNETIC RECORDING MEDIUM AND METHOD FOR MANUFACTURING THE SAME

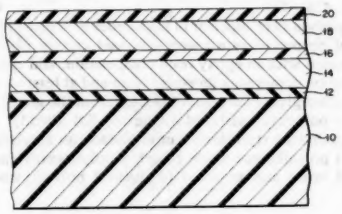
Naohiro Hanaoka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,211

Claims priority, application Japan, Apr. 6, 1981, 56-51545; Apr. 9, 1981, 56-53369

Int. Cl.[4] G11B *5/08*

U.S. Cl. 428—336 **23 Claims**



1. A magnetic recording medium comprising:

a base film;

an under coating layer formed on said base film;

a plurality of metal thin magnetic films formed on said under coating layer,

said under coating layer comprising a nonmagnetic material having a stiffness less than the stiffness of said metal thin magnetic films; and

an intermediate layer having a thickness of about 200 Å to about 800 Å which is formed between adjacent magnetic films to separate said magnetic films from each other, said intermediate layer comprising a high polymeric resin having a stiffness less than the stiffness of said magnetic films.

5. A process for making magnetic recording medium which comprises the steps of:

forming an under coating layer, comprising a nonmagnetic material having stiffness less than the stiffness of the metal thin magnetic film which is subsequently formed on said under coating layer, of a predetermined thickness on a base film, forming a first metal thin magnetic film of a predetermined thickness on said under coating layer, forming an intermediate layer of a high polymeric resin and a thickness of about 200 Å to about 800 Å on said first metal thin magnetic film, and forming a second thin magnetic film of a predetermined thickness on said intermediate layer, the stiffness of said intermediate layer being less than the stiffness of said metal thin magnetic films.

4,555,445

CORROSION RESISTANT LUBRICANT COATING COMPOSITE

Gary T. Frey, 566 Cedarbrook Dr., Painesville, Ohio 44077; Douglas H. Strong, 7466 Mountain Park Dr., Mentor, Ohio 44060, and Janet B. Urbanski, 642 High St., Fairport Harbor, Ohio 44077

Filed Mar. 30, 1984, Ser. No. 595,055
Int. Cl.⁴ B32B *9/06;* **C23F** *7/00*
U.S. Cl. 428—340 **10 Claims**

1. A coated article of manufacture having a heat resistant and corrosion-resistant coating composite that includes a smooth, uniform topcoating which article comprises substrate metal, an undercoating containing metal in elemental form, or chromium in non-elemental form, or mixtures thereof, and a heat-cured particulate-metal-free, smooth and uniform topcoating from a composition heat curable to a water resistant protective coating, said composition containing liquid medium, polyethylene-containing copolymer component and silicate substance compatible with said copolymer component in liquid medium.

4,555,446

CARBON FIBER AND PROCESS FOR PREPARING SAME

Atsushi Sumida, and Shizuo Watanabe, both of Ehime, Japan, assignors to Toray Industries, Incorporated, Japan

Filed Jun. 28, 1983, Ser. No. 508,576
Claims priority, application Japan, Jul. 5, 1982, 57-115334
Int. Cl.⁴ D02G *3/00;* **B32B** *9/00;* **B05D** *3/12*
U.S. Cl. 428—367 **4 Claims**

1. A carbon fiber superior in high-order processability and in physical properties as a composite, said carbon fiber having been treated with an epoxy resin composition, said epoxy resin composition comprising an epoxy resin and at least one polyalkylene ether glycol derivative selected from the group consisting of a polyoxyethylenized 1,6-hexanediol glycidyl ether, a polyoxyethylene styrenized cumyl phenol, an alkylene bis-(ε-glycidyl polyalkylene oxide ether), a polyoxyethylene lauryl glycidyl ether and an alkyl (ε-glycidyl polyalkylene oxide ether).

4,555,447

BLOWING WOOL INSULATION

Ronald F. Sieloff, Pataskala, and William A. Kays, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 9, 1984, Ser. No. 639,178
Int. Cl.⁴ B32B *9/00;* **B05D** *3/02;* **C03C** *25/02*
U.S. Cl. 428—392 **12 Claims**

1. Blowing wool insulation formed from glass fibers, at least a portion of the fibers surfaces coated with an effective amount of the residue produced by evaporating water from an aqueous mixture consisting essentially of 1 to 5 weight percent of a quanternary salt of ammonium ethosulfate with water comprising the balance of the mixture wherein the percentage is by weight of the aqueous mixture.

4,555,448

BIOGENETIC SILICA INSULATION

Robert L. Durham, Simonton, Tex., assignor to Agritec, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 470,748, Feb. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 297,820, Aug. 31, 1981, abandoned. This application Jul. 10, 1984, Ser. No. 629,396
Int. Cl.⁴ B32B *5/16, 9/00;* **C08J** *9/00*
U.S. Cl. 428—402 **22 Claims**

1. An insulation material comprising,

particles of biogenetic silica in amorphous state and having a substantially porous structure bound together by a physical binder effective to provide bonds which pull the particles together without compaction,

the physical binder being effective and present in an amount effective to so bind the particles together in a rigid structure without substantially filling voids of the particles thereby not substantially reducing the porosity of the particles, and

the insulation material having a porosity of at least 60% by volume.

4,555,449

MAGNETIC RECORDING MEDIUM

Joseph V. Koleske, Charleston, W. Va.; Glenn S. Peacock, Belle Mead, and George T. Kwiatkowski, Green Brook, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 9, 1984, Ser. No. 578,422
Int. Cl.⁴ G11B *5/70*
U.S. Cl. 428—411.1 **11 Claims**

1. A magnetic recording medium comprising a substrate and a magnetic recording layer thereon comprising a cured binder and magnetic particles, the binder containing a blend of a thermoplastic polymer or polymers and a polyfunctional acrylate derivative of a caprolactone-polyol characterized by the formula:

$$(CH_2{=}\underset{\displaystyle R_1}{\underset{|}{C}}COO)_m{-}R_2{-}(OH)_n \qquad (II)$$

wherein R_1 is hydrogen or methyl, R_2 is the residue of a caprolactone-polyol having an average molecular weight of from about 200 to about 10,000, m is an integer of 2 to 8 and n is an integer of 0 to 6, with the proviso that the sum of m+n is 8 or less.

4,555,450

MOISTURE-RESISTANT TRANSPARENT MERCAPTAN COMPOSITIONS

John R. Uram, Jr., Glendale, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Continuation-in-part of Ser. No. 394,204, Jul. 1, 1982, Pat. No. 4,454,201, and a continuation-in-part of Ser. No. 394,205, Jul. 1, 1982, Pat. No. 4,450,202, each is a division of Ser. No. 232,054, Feb. 5, 1981, Pat. No. 4,343,928, which is a continuation-in-part of Ser. No. 204,424, Nov. 6, 1980, Pat. No. 4,352,848, which is a continuation-in-part of Ser. No. 70,390, Aug. 28, 1979, Pat. No. 4,294,886. This application May 1, 1984, Ser. No. 605,725
Int. Cl.⁴ C08G *59/66, 59/56*
U.S. Cl. 428—412 **19 Claims**

1. A composition resistant to moisture permeation, comprising:

a blend having,

about 100 parts by weight of a mercaptain compound having at least two thio terminal groups,

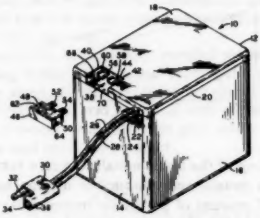
from about 20 parts to about 300 parts by epoxy resin, and

from about 0.1 to about 4.0 parts by weight of an amino-titanate compound.

4,555,451
STORAGE BATTERY WITH BUILT-IN FUSE

Lawrence R. Harrod, and Lucio C. Perego, both of Ft. Wayne, Ind., assignors to Pines of America, Inc., Fort Wayne, Ind.

Filed Jan. 29, 1985, Ser. No. 695,961
Int. Cl.[4] H01M 2/30
U.S. Cl. 429—1 7 Claims

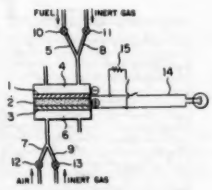


1. A battery structure comprising:
an enclosure;
at least one cell rigidly enclosed by said enclosure, said at least one cell forming a battery having first and second cell terminals within said enclosure;
fuse receiving recess means, formed in the enclosure so as to open externally of the enclosure on at least one side of the enclosure, for removably accepting a conventionally encapsulated two terminal fuse inserted from outside the enclosure to a position substantially within said recess means;
first and second fuse holder terminals rigidly supported in the fuse receiving recess means and adapted to hold the respective terminals of said fuse inserted therein;
a first electrical connection between the first cell terminal and the first fuse holder terminal, said first connection being immovably disposed fully within said enclosure;
a second electrical connection between the second fuse holder terminal, at a portion thereof within said enclosure, and a first battery terminal external of said enclosure; and
a third electrical connection between the second cell terminal, disposed within said enclosure, and a second battery terminal external of said enclosure.

4,555,452
METHOD FOR OPERATING FUEL CELL

Toshiki Kahara, Ibaraki; Toshikatsu Mori, Hitachi; Jinichi Imahashi, Hitachi; Akio Honji, Hitachi, and Kohki Tamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,132
Claims priority, application Japan, Mar. 9, 1984, 59-43903
Int. Cl.[4] H01M 8/04
U.S. Cl. 429—13 9 Claims

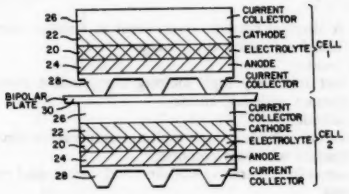


1. A method for operating a fuel cell comprising an oxidizing agent chamber subject to supply of an oxidizing agent gas and a fuel chamber subject to supply of a fuel gas, which comprises, at start to operate the fuel cell, purging the oxidizing agent chamber and the fuel chamber with an inert gas, while connecting the fuel cell to an outside auxiliary load circuit, then heating the fuel cell, then replacing the inert gas in the oxidizing agent chamber and the fuel chamber with an oxidizing agent gas and a fuel gas, respectively, and feeding the gases thereto, thereby controlling a unit cell voltage to not more than 0.85 V, and then connecting the fuel cell to an outside load circuit, thereby starting the operation of the fuel cell.

4,555,453
METHOD FOR FORMING MOLTEN CARBONATE FUEL CELL COMPONENT AND STRUCTURE

A. John Appleby, Mountain View, Calif., assignor to Electric Power Research, Inc., Palo Alto, Calif.

Filed Oct. 1, 1981, Ser. No. 307,446
Int. Cl.[4] H01M 8/14
U.S. Cl. 429—41 16 Claims

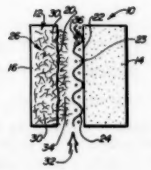


13. A component for a molten carbonate fuel cell comprising a porous fuel cell electrode and a continuous dense, porous, non-electrically conducting binder layer adhered to and supported by a surface of said electrode, said binder layer being of sufficient porosity to be impregnable with a carbonate salt and of insufficient thickness to be self-supporting.

4,555,454
REINFORCED CONSUMABLE ELECTRODE, ELECTROCHEMICAL CELL AND METHOD

Nicholas Shuster, Willoughby Hills, Ohio, assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Apr. 17, 1985, Ser. No. 724,322
Int. Cl.[4] H01M 2/38, 4/12
U.S. Cl. 429—51 22 Claims



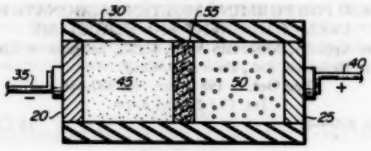
1. An electrode suitable for use in an electrochemical cell, comprising:
(a) a solid body of a reactive metal which is consumable by reaction with a liquid electrolyte, said body defining at least one surface to be contacted by said electrolyte during operation;
(b) a fibrous network of electrically insulating reinforcing material at least partially embedded in said body with at least a portion of said network disposed in said body in close proximity to said surface for contact with said electrolyte as metal at said surface is consumed by reaction with said electrolyte.

4,555,455

AMBIENT TEMPERATURE THERMAL BATTERY

Aaron N. Fletcher; George E. McManis, III, and Dan E. Bliss, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1985, Ser. No. 701,724
Int. Cl.[4] H01M 6/36
U.S. Cl. 429—112 19 Claims



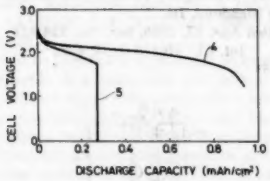
1. A thermal battery, operational at ambient temperatures after initial activation comprising:
an anode;
a first relatively high melting temperature electrolyte in contact with said anode;
a cathode;
a second relatively high melting temperature electrolyte in contact with said cathode;
a means for separating said first and said second electrolyte; and
a means for mixing said first and said second electrolytes to form a low melting temperature electrolyte.

4,555,456

CATHODE STRUCTURE FOR THIN FILM BATTERY

Kelichi Kanehori, Sayama; Katsuki Miyauchi, Hino; Yukio Ito, Sayama; Fumiyoshi Kirino, Suginami, and Tetsuichi Kudo, Setagaya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,857
Claims priority, application Japan, May 26, 1983, 58-91438
Int. Cl.[4] H01M 2/14, 4/58
U.S. Cl. 429—131 7 Claims



1. In a thin film battery comprising a cathode and anode sandwiching an electrolyte, the improvement comprising wherein the cathode structure comprises a titanium disulfide thin film as a cathode active material disposed on a substrate, with a layer of titanium oxide being formed between the substrate and the titanium disulfide thin film.

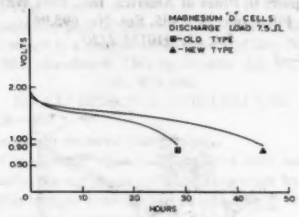
4,555,457

BATTERY CELL CONTAINING POTASSIUM MONOPEROXYSULFATE IN THE CATHODE MIX

Shiraz A. Dhanji, Sunrise, Fla., assignor to ACR Electronics Inc., Hollywood, Fla.

Filed Sep. 28, 1983, Ser. No. 536,634
Int. Cl.[4] H01M 6/06
U.S. Cl. 429—199 18 Claims

1. A battery cell containing an anode, a current collector, and a combined cathode dry mix and aqueous electrolyte primarily composed of manganese dioxide, in which said dry mix includes one or more oxides of a metal selected from the



group consisting of the noble metals, the rare earth metals, the alkaline earth metals, and conductive metals; and further includes a small amount of potassium monoperoxysulfate.

4,555,458

ELECTROLYTE FOR A LEAD ACID ACCUMULATOR, AND AN ACCUMULATOR USING SAID ELECTROLYTE

Pierre Mirebeau, Villebon sur Yvette, and Jean Gindre, Vierzon, both of France, assignors to Compagnie Europeenne d'Accumulateurs, S.A., Paris, France

PCT No. PCT/FR83/00030, § 371 Date Sep. 15, 1983, § 102(e) Date Sep. 15, 1983
PCT Filed Feb. 15, 1983, Ser. No. 537,390
Claims priority, application France, Feb. 15, 1982, 82 02420
Int. Cl.[4] H01M 6/04
U.S. Cl. 429—203 4 Claims

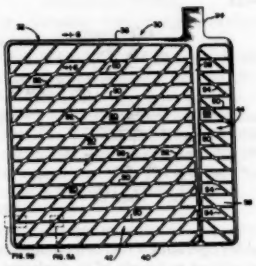
1. An electrolyte for a lead acid accumulator, in which the electrolyte comprises an aqueous solution of sulphuric acid which includes orthophosphoric and pyrophosphoric acid, wherein said electrolyte is prepared by the step of adding an amount of pyrophosphoric and an amount of metaphosphoric acid to the aqueous sulphuric acid to provide an electrolyte, the initial concentration of which is 5 to 30 grams per liter of said electrolyte of pyrophosphoric acid and 5 to 50 grams per liter of said electrolyte of orthophosphoric acid, the total quantity of phosphoric acids contained in the electrolyte being equal to or less than 60 grams per liter.

4,555,459

BATTERY GRIDS

Carl Anderson, Hamburg, Pa., and Richard H. Craig, Trenton, N.J., assignors to General Battery Corporation, Reading, Pa.

Filed Jan. 18, 1984, Ser. No. 571,862
Int. Cl.[4] H01M 4/73
U.S. Cl. 429—211 14 Claims



1. A battery grid comprising:
a rectangular frame having a lug projecting from one side thereof;
said lug located between the center and one end of said side;

a partition member extending from said lug across said frame such that said frame is partitioned into first and second rectangular sections; and

a planar network of intersecting grid wires within said frame including:

a first array of substantially parallel wires extending across said frame and parallel with the lug side of said frame;

a second array of substantially parallel wires extending diagonally across said first rectangular frame section and such that the wires of said second array are sloped toward said lug; and

a third array of substantially parallel wires diagonally extending across said second rectangular section such that the wires of said third array are sloped toward said lug; wherein the grid wires of said second and third arrays intersect with alternate grid wires of said first array at said partition member.

4,555,460

MASK FOR THE FORMATION OF PATTERNS IN LACQUER LAYERS BY MEANS OF X-RAY LITHOGRAPHY AND METHOD OF MANUFACTURING SAME

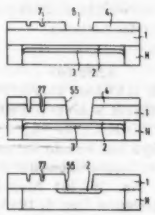
Margret Harms, Hamburg; Angelika Bruns, Henstedt-Ulzbur; Holger Luthje, Halstenbek, and Bernd Matthiessen, Seevetal, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,352

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232498

Int. Cl.[4] G02B *5/00, 7/00;* G03F *1/00*

U.S. Cl. 430—5 **6 Claims**



1. A mask for producing patterns in lacquer layers by means of X-ray lithography comprising a diaphragm of metal opaque to visible light and transparent to X-radiation, and an absorber pattern layer present on one of the major surfaces of the diaphragm for absorbing the X-ray radiation and structured in accordance with the pattern to be produced, characterized in that the diaphragm has adjustment windows transparent to visible light.

4,555,461

PROCESS FOR PREPARING A LITHOGRAPHIC PRINTING PLATE

Keisuke Shiba; Tetsuro Fuchizawa; Sho Nakao, and Chikashi Ohishi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 427,037, Sep. 29, 1982, abandoned. This application Mar. 26, 1985, Ser. No. 715,997

Claims priority, application Japan, Oct. 1, 1981, 56-156829

Int. Cl.[4] G03G *5/10, 13/26*

U.S. Cl. 430—49 **17 Claims**

1. In a process of preparing a lithographic printing plate comprising uniformly charging a photoconductive layer of an electrophotographic plate-making material, subjecting the charged plate making material to imagewise exposure, developing the imagewise exposed plate-making material to form a toner image, fixing the toner image and treating the photoconductive layer with a desensitizing solution to render the non-toner image area hydrophilic to thereby produce the lithographic printing plate, the improvement characterized in that said plate making material comprises:

a substrate comprising a paper support and a polyolefin laminate layer containing an electroconductive material on at least one surface thereof and having a volume resistance of 10^{10} ohms or less, and

a photoconductive layer on said substrate.

4,555,462

PRINTING MEMBER FOR ELECTROSTATIC PHOTOCOPYING

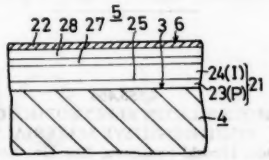
Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 276,503, Jun. 23, 1981, Pat. No. 4,418,132. This application Jul. 21, 1983, Ser. No. 502,630

Claims priority, application Japan, Jun. 25, 1980, 55-86801

Int. Cl.[4] G03G *5/082, 5/14*

U.S. Cl. 430—57 **12 Claims**



1. A printing member for electrostatic photocopying, comprising:

a substrate having a conductive surface; and

photoelectrically-sensitive, electrically chargeable layer on the conductive surface of the substrate;

wherein the photoelectrically-sensitive, electrically chargeable layer has a photoelectrically-sensitive non-single crystal semiconductor layer on the substrate, a charge blocking layer on the photoelectrically-sensitive non-single crystal semiconductor layer, a charge storing non-single crystal semiconductor layer on the charge blocking layer and a chargeable layer formed on the charge storing non-single crystal semiconductor layer and permeable to light and electrical carriers; and wherein the charge storing layer has a smaller energy band gap than the last-mentioned chargeable layer and the charge blocking layer;

wherein the photoelectrically-sensitive, non-single crystal semiconductor layer has a first layer on the substrate, and a second layer on the first layer to create a transition region;

wherein each of said first, second, and charge storing layers is formed principally from materials selected from the group consisting of Si, Si_3N_{4-x} $(0<x<4)$, SiC_{1-x} $(0<x<1)$, or SiO_{2-x} $(0<x<2)$ and contains materials selected from the group consisting of hydrogen, chlorine, or fluorine; and

wherein the first layer is P or N type and the second layer is I type, and the transition region is PI or NI depending on whether the first region is P or N type.

4,555,463

PHOTORESPONSIVE IMAGING MEMBERS WITH CHLOROINDIUM PHTHALOCYANINE COMPOSITIONS

Ah-Mee Hor, Mississauga, and Rafik O. Loutfy, Willowdale, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

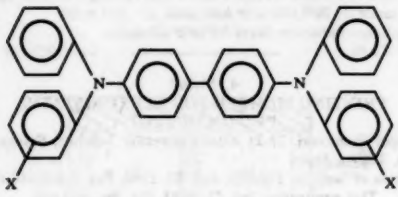
Filed Aug. 22, 1984, Ser. No. 643,218

Int. Cl.[4] G03G *5/10*

U.S. Cl. 430—59 **27 Claims**

1. An improved photoresponsive imaging member consisting essentially of (1) a supporting substrate, (2) an adhesive

layer, (3) a photogenerating layer in contact therewith comprised of chloroindium phthalocyanine, and (4) a hole transport layer comprised of an arylamine of the following formula dispersed in an inactive resinous binder composition:



wherein X is an alkyl group, or a halogen.

4,555,464

AMORPHOUS SILICON ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Keishiro Kido; Hiroshi Sunagawa; Kazuhiro Kawajiri; Toshio Iijima, and Nobuharu Nozaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 6, 1984, Ser. No. 628,363

Claims priority, application Japan, Jul. 6, 1983, 58-122868

Int. Cl.⁴ G03G *5/082, 5/14*

U.S. Cl. 430—67 **7 Claims**

1. An electrophotographic photosensitive material comprising a conductive support having thereon, in succession, a photoconductive layer composed of an amorphous silicon containing silicon atoms and hydrogen atoms and a barrier layer mainly composed of silicon and a further element selected from the group consisting of carbon, nitrogen and oxygen and further on the barrier layer a surface improvement layer having a composition of carbon and silicon of from 0.70/1 to 0.95/1 by atomic ratio in carbon/carbon+silicon, and said composition ratio being larger than that of the barrier layer.

4,555,465

PHOTOCONDUCTIVE MEMBER OF AMORPHOUS SILICON

Kyosuke Ogawa, Tokyo; Shigeru Shirai, Yamato; Keishi Saitoh, Tokyo; Teruo Misumi, Kawasaki, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1983, Ser. No. 561,991

Claims priority, application Japan, Dec. 20, 1982, 57-222095

Int. Cl.⁴ G03G *5/082*

U.S. Cl. 430—95 **28 Claims**

1. A photoconductive member comprising a support and a light receiving layer provided on said support, having photoconductivity and containing an amorphorous material comprising silicon atoms as a matrix and at least hydrogen atoms as constituent atoms in said light receiving layer having a layer region with depth profile such that the content of hydrogen atoms contained therein is decreased in the direction of layer thickness toward both ends of said layer.

4,555,466

DEVELOPER COMPRISING A CARRIER COATED WITH FE_3O_4 DISPERSED IN A BUTADIENE POLYMER, AND A TONER

Seiji Okada, Sagamihara; Isao Watanabe, Kawasaki; Norio Sawatari, Sagamihara; Kazumasa Saito, Atsugi; Toshiaki Narusawa, and Hirofumi Okuyama, both of Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 21, 1983, Ser. No. 534,462

Claims priority, application Japan, Sep. 27, 1982, 57-166714; Jan. 14, 1983, 58-3290

Int. Cl.⁴ G03G *9/10, 11/00*

U.S. Cl. 430—106.6 **11 Claims**

1. A developing material for electrostatic images comprising:

(a) carrier particles the electric resistivity of which is from 10^5 to 10^7 Ω·cm comprising iron beads having an average diameter of from 30 to 500 μm, coated with a layer comprising a butadiene polymer resin in which Fe_3O_4 powder is dispersed, said butadiene polymer resin comprises either a butadiene homopolymer the number average molecular weight of which is from 10,000 to 200,000 and which contains at least 50% by weight of 1,2-polybutadiene units, or a cyclized 1,4-cis-polybutadiene homopolymer, or a cyclized 1,4-cis-butadiene-styrene or cyclized 1,4-cis-butadiene-acrylonitrile copolymer which copolymer contains at least 50% by weight of 1,4-cis-polybutadiene units, or a mixture thereof, the volume ratio of said butadiene resin to Fe_3O_4 powder being from 1:2 to 4:1, and said butadiene polymer being cured by heating with an organic peroxide in an amount of from 0.5 to 5.0 parts by weight based on 100 parts by weight of said butadiene polymer, and

(b) from 1% to 6% by weight of toner particles, based on the weight of said carrier particles.

4,555,467

DEVELOPER HAVING IMPROVED FLOW CHARACTERISTICS AND A PROCESS FOR PRODUCING SAME

Tetsuo Hasegawa, Tokyo, and Koushi Suematsu, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 352,261 filed Feb. 25, 1982 now abandoned. This application Dec. 6, 1983, Ser. No. 558,702

Claims priority, application Japan, Mar. 10, 1981, 56-34374; Mar. 25, 1981, 56-43431

Int. Cl.⁴ G03G *9/08*

U.S. Cl. 430—110 **14 Claims**

1. A one-component developer which comprises toner particles and flowability improver granules; said granules each comprising a plurality of primary flowability improver particles, said flowability improver granules having a granule size of 1–20 the average particle size of the toner particles, and said primary flowability improver particles having an average particle size smaller than the average particle size of the toner particles; wherein said granules are capable of releasing said primary flowability improver particles over a continued period of use.

4,555,468

PHOTOSENSITIVE DIAZONIUM MATERIAL WITH PRECOAT OF GRAFT POLYMER PREPARED BY GRAFTING CELLULOSE DERIVATION WITH RADICAL POLYMERIZABLE MONOMER

Takashi Yano, Amagasaki, and Masahiro Asami, Himeji, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed May 1, 1984, Ser. No. 605,727

Claims priority, application Japan, May 4, 1983, 58-77567; May 18, 1983, 58-87111; May 18, 1983, 58-87112

Int. Cl.⁴ G03C *1/80, 1/76*

U.S. Cl. 430—160 **10 Claims**

1. In a photosensitive diazotype reproducing material which

comprises a polyethylene terephthalate support film, a precoat layer coated on said support film and a light-sensitive layer coated on said precoat layer, said light-sensitive layer comprising a light-sensitive diazonium compound, the improvement which comprises: said precoat layer consists essentially of a graft polymer which has been prepared by polymerizing from 70 to 99 wt. % of at least one radical-polymerizable monomer capable of grafting to a cellulose derivative, in the presence of from 1 to 30 wt. % of a cellulose derivative selected from the group consisting of cellulose ethers, cellulose esters and mixture thereof, under radical polymerization conditions, to form said graft polymer, said precoat layer being effective to firmly attach said light-sensitive layer to said support film.

4,555,469

PROCESS OF PREPARING LIGHT-SENSITIVE NAPHTHOQUINONEDIAZIDESULFONIC ACID ESTER

Fritz Erdmann, and Ulrich Simon, both of Mainz, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 333,338, Dec. 22, 1981, Pat. No. 4,424,270. This application Oct. 14, 1983, Ser. No. 542,173

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1981, 3100077

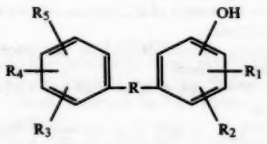
Int. Cl.⁴ G03C *1/54*; C07C *113/00*

U.S. Cl. 430—168 **20 Claims**

1. A process for preparing a light-sensitive naphthoquinonediazide-sulfonic acid ester which is non-explosive, comprising the steps of (I) reacting a naphthoquinonediazidesulfonyl halide in the presence of a base and a solvent with a mixture comprising:

A. a polymeric compound having recurring units, each of said recurring units containing at least one phenolic hydroxyl group, and

B. a low molecular weight compound corresponding to the formula



wherein

(1a) R denotes a single bond or one from the group consisting of CO, S, O, SO_2 and CR_6R_7;

(b) R_1, R_2, R_3, and R_5 represent hydrogen, halogen, hydroxyl groups, alkyl group having 1 to 4 carbon atoms or alkoxy groups having 1 to 4 carbon atoms; and

(c) R_6 and R_7 represent hydrogen or alkyl groups having 1 to 4 carbon atoms; or wherein

(2a) two of the radicals R_3, R_4, and R_5 and the radicals R_1 and R_2 in each case jointly form a fused aromatic ring; and

(b) at least one of the radicals R_1, R_2, R_3, R_4, and R_5 represents a hydroxyl group, wherein (i) said polymeric compound and said low molecular weight compound are present in a ratio in the range of 0.1–20:1 and (ii) said ester has a diazo nitrogen content of between about 2% and about 9%; and (II) isolating the reaction product of step (I).

4,555,470

HEAT-DEVELOPABLE COLOR PHOTOGRAPHIC MATERIAL WITH HEAT FUSIBLE COMPOUND

Yukihiko Sakaguchi; Kozo Sato; Hideki Naito, and Hiroshi Hara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 2, 1983, Ser. No. 548,190

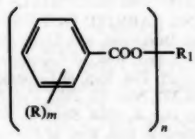
Claims priority, application Japan, Nov. 2, 1982, 57-193080

Int. Cl.⁴ G03C *1/40, 5/54*

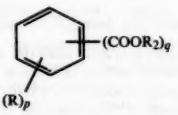
U.S. Cl. 430—203 **19 Claims**

13. A method for forming a color image, comprising the steps of:

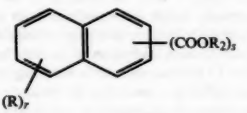
providing a heat-developable color photographic material comprising a support having thereon, a light-sensitive silver halide, a hydrophilic binder, a dye releasing redox compound and a heat fusible compound which has a melting point of 60° C. or higher, said heat fusible compound containing the dye releasing redox compound and dispersed in said hydrophilic binder, the heat fusible compound being represented by a general formula selected from the group of general formulae consisting of: (I), (II) and (III):



(I)



(II)



(III)

wherein m represents an integer from 1 to 3; n represents as integer from 1 to 8; q represents an integer from 1 to 4; p represents an integer which meets the requirement for p+q=6; s represents an integer from 1 to 4; r represents an integer which meets the requirement for r+s=8; R represents a hydrogen atom or a substituent selected from an alkyl group, a cycloalkyl group, an aryl group an alkoxy group, an aryloxy group, an aralkyl group, an acyl group, an acylamino group, an alkylsulfonylamino group, an arylsulfonylamino group, an alkoxyalkyl group, an aryloxyalkyl group, an acyloxy group, an acyloxyalkyl group, a carbamoyl group, a N-substituted carbamoyl group, a ureido group, a N-substituted ureido group, an alkylamino group, a dialkylamino group, an arylamino group, a halogen atom, a hydroxy group, a carboxy group, a nitro group, a cyano group, an alkoxycarbonyl group, an sryloxycarbonyl group and a cycloalkyloxycarbonyl group and the alkyl moiety, the cycloalkyl moiety and the aryl moiety of the substituents may be further substituted with a halogen atom, a hydroxy atom, a hydroxy group, an alkoxy group, a cyano group, an aryloxy group, an alkyl group, an alkoxycarbonyl group or an aryloxycarbonyl group, and when m, p or r represents 2 r more, R may be the same or different; R_1 represents an organic group derived from a compound of the formula $R_1—(OH)_n$ which is derived form a compound represented by the formula (IV), (V) or (VI):

$R_3—(OH)_t$ (IV)

$$HO-(R_4)_u-H \quad (V)$$

$$R_5-[(O)_v-(CH_2)_w-OH]_t \quad (VI)$$

wherein R_3 represents a t valent residue of an alkyl group, a substituted alkyl group, a cycloalkyl group or a substituted cycloalkyl group; R_4 represents an alkylene group or a substituted alkylene group; R_5 represents a t valent residue of an aryl group or a substituted aryl group; t represents an integer from 1 to 4; u represents an integer from 1 to 3; v represents 0 or an integer of 1; and w represents 0 or an integer from 1 to 3; wherein R_2 is a phenyl group, a substituted phenyl group, an alkyl group, a substituted alkyl group, a cycloalkyl group or a substituted cycloalkyl group;

imagewise exposing the heat-developable color photographic material;

developing the material by heating the material to a temperature in the range of 80° C. to 250° C. to release a hydrophilic diffusible dye; and

transferring the diffusible dye onto an image receiving material.

4,555,471

IMAGE-RECORDING MATERIALS AND IMAGE-RECORDING CARRIED OUT USING THESE

Helmut Barzynski, Bad Durkheim, and Klaus Holoch, Bobenheim-Roxheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 554,327, Nov. 22, 1983, Pat. No. 4,515,877. This application Dec. 4, 1984, Ser. No. 678,051

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243943

Int. Cl.⁴ G03C *1/71*; G03F *7/02*

U.S. Cl. 430—273 **5 Claims**

1. A multilayer image-recording material suitable for the production of a relief image, which comprises, located one on top of the other in the stated sequence, a dimensionally stable support (S), a photosensitive relief-forming layer (RL) and a mask-forming layer (ML), with or without a top layer (T), wherein a dimensionally stable intermediate layer (I) which is transparent to actinic light in the wavelength range from 300 to 420 nm and is stable to heat radiation is present between the relief-forming layer (RL) and the mask-forming layer (ML), and the latter layer (ML) is sensitive to heat radiation and contains a thermochromic system which, when irradiated with an IR laser having a wavelength greater than 1.00 μm, undergoes an irreversible change in its absorption spectrum in the range from 300 to 420 nm so that the optical density of the mask-forming layer (ML) in this wavelength range changes by not less than 1.3 units.

5. A process for the production of a relief image by means of a multilayer image-recording material as claimed in claim 1, wherein any top film (T) present is removed, the mask-forming layer (ML) is subjected to imagewise irradiation with heat using an IR laser having a wavelength greater than 1.00 μm, the multilayer image-recording material is exposed completely, through the mask layer (ML), to actinic light having a wavelength of from 300 to 420 nm, the intermediate layer (I) together with the mask layer (ML) is removed from the relief-forming layer (RL), and the relief image is then developed from the relief-forming layer (RL) in a conventional manner.

4,555,472

ORGANIC COATING FILM AND RADIATION-SENSITIVE MEMBER HAVING THE FILM

Kazuharu Katagiri, and Yoshihiro Oguchi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

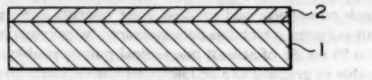
Filed Feb. 6, 1984, Ser. No. 577,208

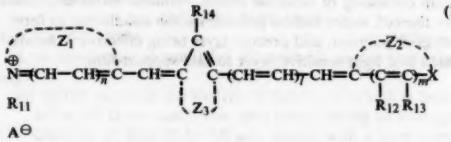
Claims priority, application Japan, Feb. 9, 1983, 58-18785; Feb. 9, 1983, 58-20786

Int. Cl.⁴ G03C *1/72, 1/94*

U.S. Cl. 430—278 **13 Claims**

1. An optical recording member including, in sequence, a disc substrate, and a film comprising a compound of the general formula:





(I)

wherein; Z_1 is an atomic group necessary to form a substituted or unsubstituted nitrogen-containing heterocyclic compound ring; Z_2 is an atomic group necessary to form a substituted or unsubstituted pyrane, thiapyrane, selenapyrane, benzopyrane, benzothiapyrane, benzoselenapyrane, naphthopyrane, naphathiopyrane, or naphthoselenapyrane ring; X is a sulfur, oxygen, or selenium; Z_3 is a divalent hydrocarbon residue necessary to form a 5- or 6-membered ring substituted or unsubstituted; R_{11} is a hydrogen atom or substituted or unsubstituted alkyl; R_{12} and R_{13} each are a hydrogen atom, halogen atom, alkyl, alkoxyl, aryl, substituted aryl, styryl, substituted styryl, or substituted or unsubstituted heterocyclic residue; R_{14} is a hydrogen or halogen atom; $A^{\ominus}$ is an anion; m and n each are 0 or 1; and l is 0, 1, or 2.

4,555,473

ALKALI DEVELOPABLE PHOTOPOLYMER CRYSTALLINE COMPOSITION

Thomas E. Dueber, and William J. Nebe, both of Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Dec. 6, 1984, Ser. No. 678,884

Int. Cl.⁴ G03C *1/68*

U.S. Cl. 430—281 **10 Claims**

1. A photopolymerizable crystalline composition soluble in aqueous alkaline solutions having a crystallinity index of at least 0.2 consisting essentially of

(a) 10 to 40% by weight of at least one ethylenically unsaturated compound;

(b) an initiating amount of at least one photoinitiator or photoinitiator system;

(c) 20 to 40% by weight of at least one acidic polymeric binder; and

(d) 20 to 50% by weight of a crystalline matrix forming compound having a melting point in the range of 50° to 200° C. selected from the group consisting of bibenzyl, biphenyl, pentamethylbenzene, 1,4-diethoxybenzene, 1,2-diphenoxyethane, octahydroanthracene, docosane, octacosane and, dotriacontane.

4,555,474

PHOTOPOLYMERIZABLE COMPOSITION

Kouichi Kawamura; Yoshimasa Aotani, and Akira Umehara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 4, 1985, Ser. No. 697,813

Claims priority, application Japan, Feb. 2, 1984, 59-17339

Int. Cl.⁴ G03C *1/68*

U.S. Cl. 430—281 **20 Claims**

1. A photopolymerizable composition comprising a polymerizable compound having an ethylenically unsaturated bond and a photopolymerization initiator represented by formula (I)

(I)

wherein Z represents a non-metallic atomic group forming a substituted or unsubstituted nitrogen-containing heterocyclic ring; and R represents a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic ring.

4,555,475

METHOD OF MAKING A PLANOGRAPHIC PRINTING MEMBER WITH ALUMINIUM SILICATE

Alan R. Gamson, and Phillip R. Kellner, both of London, England, assignors to Crossfield Electronic Limited, London, England

PCT No. PCT/GB83/00003, § 371 Date Aug. 29, 1983, § 102(e) Date Aug. 29, 1983, PCT Pub. No. WO83/02505, PCT Pub. Date Jul. 21, 1983

PCT Filed Jan. 14, 1983, Ser. No. 531,896

Claims priority, application United Kingdom, Jan. 15, 1982, 8201171; Jan. 15, 1982, 8201168

Int. Cl.[4] G06F *7/00*

U.S. Cl. 430—309 **13 Claims**

1. A method of forming a print resistant image on a planographic printing member comprising an aluminum substrate carrying an image forming layer that consists essentially of an image forming amount of aluminum silicate formed by contacting the substrate with an aqueous metal silicate solution, the method comprising effecting imagewise photoexposure of the image forming layer by infrared laser radiation having a wavelength of 0.8 to 4 microns and thereby forming an oleophilic image in the aluminum silicate layer and then applying a selective coating composition that is an emulsion of an aqueous phase with an organic phase and in which the organic phase includes a film forming oleophilic resin that preferentially wets and is deposited as a film on the oleophilic image areas and the aqueous phase preferentially wets and presents resin deposition on the less oleophilic, non-image areas, and the resin is then hardened to form a film having improved chemical resistance and scratch resistance compared to the oleophilic image in the aluminum silicate layer.

4,555,476

HEAT DEVELOPMENT PROCESS WITH STABILIZER

Yukihiko Sakaguchi; Toshiaki Aono, and Shinsaku Fujita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

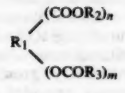
Filed Mar. 29, 1984, Ser. No. 594,667

Claims priority, application Japan, Mar. 30, 1983, 58-54167

Int. Cl.[4] G03C *1/40, 5/54*

U.S. Cl. 430—351 **7 Claims**

1. An image-forming process, which comprises heating a photographic material comprising a support having provided thereon at least light-sensitive silver halide, binder, and a dye releasing redox compound in the presence of a compound represented by the following general formula (A):



wherein R_1 represents a (m+n)-valent straight, branched or cyclic alkane or a (m+n)-valent straight, branched or cyclic alkene, R_2 and R_3, which may be the same or different, each represents a straight, branched or cyclic alkyl group or a straight, branched or cyclic alkenyl group, n represents 0, 1, 2 or 3, and m represents 0, 1 or 2, with m+n being 1 or more, after, or simultaneously with, imagewise exposure in the state of substantial absence of water to thereby imagewise form a mobile dye, wherein said thermally developable photographic material comprises said support having thereon one or more layers containing said light-sensitive silver halide which is a high-sensitive silver halide, said dye releasing redox compound, said binder, an organic silver salt and compound of general formula (A), said compound of general formula (A) improving stability of said thermally developable photographic material during storage before thermal development processing and depressing changes in maximum density, wherein the alkane or alkene represented by R_1 is substituted by a halogen atom, an alkoxy group, or an alkyl group, or has an epoxy group; the alkyl or alkenyl group represented by R_2 is substituted by a halogen atom, a hydroxy group, an alkyl group, —OOCR′, wherein R′ represents an alkyl or alkenyl group containing 1 to 20 carbon atoms, an alkoxy group, or has an epoxy group; and the alkyl or alkenyl group represented by R_3 is substituted by a halogen atom, an alkyl group, —OOCR′, wherein R′ represents an alkyl or alkenyl group containing 1 to 20 carbon atoms, an alkoxy group or has an epoxy group.

4,555,477

PHOTOGRAPHIC ELEMENT AND PROCESS UTILIZING METAL COMPLEX COLOR MASKING DYES

William N. Washburn, Ionia, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1985, Ser. No. 688,479

Int. Cl.[4] G03C *1/40, 7/18*

U.S. Cl. 430—359 **15 Claims**

1. A photographic element comprising a support having thereon at least one silver halide emulsion layer having associated therewith a compound for providing a dye image in exposed areas of said element, and

an essentially colorless, immobile, ligand-releasing compound of the structure LIG-X wherein X is a group which, as a function of silver halide development is cleaved from LIG, and LIG is a ligand capable of complexing with metal ions while joined to X to form a color dye image in the unexposed areas of said element.

11. A process of color correction in an imagewise exposed element of claim 1, said process comprising the steps of:

(a) developing the imagewise exposed areas of said element with a color developing agent, thereby cleaving LIG from X and washing substantially all of the cleaved LIG out of said element; and

(b) treating said element with metal ions to form a color masking dye with LIG-X in the unexposed areas of said element.

4,555,478

PHOTOGRAPHIC ELEMENT AND PROCESS FOR PROVIDING METAL COMPLEX COLOR IMAGES

James A. Reczek, and Janice M. Palumbo, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1985, Ser. No. 688,478

Int. Cl.[4] G03C *1/40, 7/32*

U.S. Cl. 430—367 **20 Claims**

1. A photographic element comprising a support having thereon at least one silver halide emulsion layer having associated therewith an essentially colorless, immobile, ligand-releasing compound of the structure LIG-X wherein LIG is a ligand which is capable of complexing with metal ions to form a metal complex dye, and X is a group which, as a function of silver halide development, is cleaved from LIG.

16. A process of forming a dye image in an imagewise exposed element of claim 1, said process comprising the steps of

(a) developing said element to imagewise cleave the bond between LIG and X as a function of development; and

(b) treating said element with metal ions to form a metal complex dye with LIG and said metal ions.

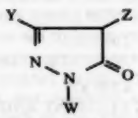
4,555,479

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Nobuo Sakai; Masaki Okazaki, and Yoshio Inagaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

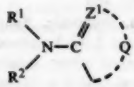
Filed May 25, 1984, Ser. No. 614,091
Claims priority, application Japan, May 25, 1983, 58-92082
Int. Cl.[4] G03C 7/40, 7/26
U.S. Cl. 430—372 **21 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having coated thereon at least one silver halide emulsion layer, the color photographic light-sensitive material having at least one layer containing at least one of 2-equivalent magenta coupler of the 5-pyrazolone type represented by the following general formula (I):



(I)

wherein W represents a phenyl group substituted with at least one substituent selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, an alkoxycarbonyl group and a cyano group; Y represents an acylamino group or an anilino group; and Z represents a group capable of being released upon coupling, and at least one compound represented by the following general formula (II):



(II)

wherein R^1 and R^2, which may be the same or different, each represents a hydrogen atom, an alkyl group or an aryl group, provided that both R^1 and R^2 do not represent hydrogen atoms at the same time; Z^1 represents a methine group or the group —N=; and Q represents an atomic group which contains a nitrogen atom, a sulfur atom or an oxygen atom and is necessary to form a 5-membered or a 6-membered heterocyclic ring together with the group

wherein the group capable of being released upon coupling represented by Z is an aryloxy group, an alkoxy group, a heterocyclic oxy group, a silyoxy group, a phosphonoxy group, an alkylthio group, an arylthio groups, a heterocyclic group, a heterocyclic thio group, an acylthio group, a thiocyano group, an aminothiocarbonylthio group, an acylamino group, a sulfonamido group, an alkoxycarbonylamino group, an aryloxycarbonylamino group or a nitrogen-containing heterocyclic group which is connected to the active position of the pyrazolone ring through the nitrogen atom; and

wherein the aryl group represented by R^1 or R^2 is an aryl group having from 6 to 38 carbon atoms which may be substituted with a halogen atom, an aryl group, a heterocyclic group, a cyano group, an alkoxy group, an aryloxy group, an acylamino group, an imido group, an anilino group, an alkylamino group, a heterocyclic amino group, a ureido group, a sulfamoylamino group, an alkylthio group, an arylthio group, a heterocyclic thio group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, a sulfinyl group, an acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a phosphonyl group, an imino group, a cyanothio group, an acyloxy group, a carbamoyloxy group, a silyloxy group, a sulfonyloxy group, a heterocyclic oxy group, a hydroxy group or a nitro group.

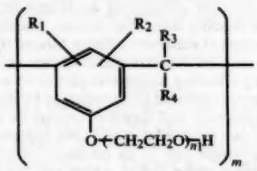
4,555,480

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A POLYOXYETHYLENE SURFACTANT AND A NITRON COMPOUND

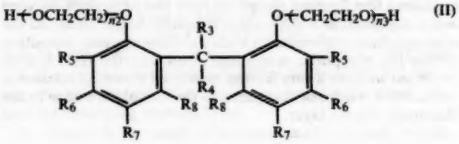
Shigeki Yokoyama; Koki Nakamura; Jyounichi Kouda, and Nobuhisa Sekiguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 4, 1984, Ser. No. 657,699
Claims priority, application Japan, Oct. 4, 1983, 58-185304
Int. Cl.[4] G03C 1/82
U.S. Cl. 430—527 **26 Claims**

1. A silver halide photographic light-sensitive element comprising a support having thereon at least one light-sensitive silver halide emulsion layer, wherein the light-sensitive silver halide emulsion layer or other layer is a hydrophilic colloid layer containing a polyoxyethylene surface active agent represented by general formula (I) or (II) described below, and a nitron compound selected from nitron, an inorganic acid salt thereof and an organic acid salt thereof,



(I)



(II)

wherein R_1, R_2, R_6 and R_8, which may be the same or different, each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a halogen atom, a substituted or unsubstituted acyl group, a substituted or unsubstituted amido group, a substituted or unsubstituted sulfonamido group, a substituted or unsubstituted carbamoyl group or a substituted or unsubstituted sulfamoyl group; R_5 and R_7, which may be the same or different, each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a halogen atom, a substituted or unsubstituted acyl group, a substituted or unsubstituted amido group, a substituted or unsubstituted sulfonamido group, a substituted or unsubstituted carbamoyl group or a substituted or unsubstituted sulfamoyl group, provided that R_5 and R_6 or R_7 and R_8 may combine to form a substituted or unsubstituted ring; R_3 and R_4 each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted α-furyl group, provided that R_3 and R_4 may combine to form a ring; n_1, n_2, n_3 and m, which may be the same or different, each is an integer of from 2 to 50; and in general formula (II) the substituents represented by R_5, R_6, R_7 and R_8 on the two benzene rings may be bilaterally symmetrical or asymmetrical.

4,555,481

SILVER HALIDE PHOTOGRAPHIC EMULSIONS CONTAINING BENZIMIDAZOLOCARBOCYANINE DYE HAVING FLUOROALKYL GROUP AT THE NITROGEN ATOM OF BENZIMIDAZOLE

Toshinao Ukai; Masaki Okazaki; Haruo Takei, and Ichizo Toya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

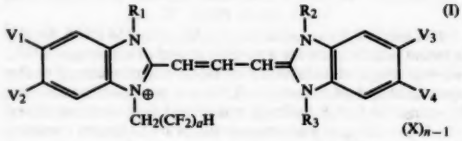
Filed Jan. 25, 1984, Ser. No. 573,760

Claims priority, application Japan, Jan. 25, 1983, 58-10090; Sep. 22, 1983, 58-175939

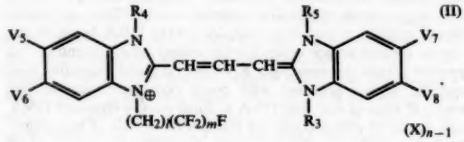
Int. Cl.⁴ G03C *7/26, 7/32, 1/10*

U.S. Cl. 430—550 **10 Claims**

1. A silver halide photographic emulsion which contains at least one of benzimidazolocarbocyanine dyes represented by the general formula (I) or (II):



(I)



(II)

wherein a represents an integer of 1 to 8, R_1, R_2 and R_3, which may be identical with or different from one another, represent each $-CH_2(CF_2)_bH$ or a substituted or unsubstituted alkyl group, but at least one of R_1, R_2 and R_3 contains an acid group containing an alkyl group, wherein b, which may be identical with or different from a, represents an integer of 1 to 8, l represents 0 or an integer of 1 to 8, and m represents 0 or an integer of 1 to 8, but $l+m>0$; R_4 represents $-(CH_2)_j(CF_2)_kF$ or a substituted or unsubstituted alkyl group, R_5 and R_6, which may be the same or different, each represents an unsubstituted alkyl group or substituted alkyl group substituted with carboxy, sulfo, cyano, halogen, hydroxy, alkoxycarbonyl, alkoxy, monocyclic aryloxy, acyloxy, acyl, carbamoyl or sulfomoyl, but at least one of R_4, R_5 and R_6 represents an acid group-containing alkyl group; j represents 0 or an integer of 1 to 8; and k represents 0 or an integer of 1 to 8, but $j+k>0$; V_1, V_2, V_3, V_4, V_5, V_6, V_7, and V_8, which may be identical with or different from one another, represent each a hydrogen atom, a halogen atom, a substituted alkyl group, an unsubstituted alkyl group, an alkoxy group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfomoyl group, a cyano group or a trifluoromethyl group; X represents an anion; and n represents 1 or 2 but represents 1 when the dye forms an inner salt.

4,555,482

SILVER HALIDE PHOTOGRAPHIC EMULSION

Noriyuki Inoue; Masaki Okazaki; Kiyohiko Yamamuro, and Haruo Takei, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

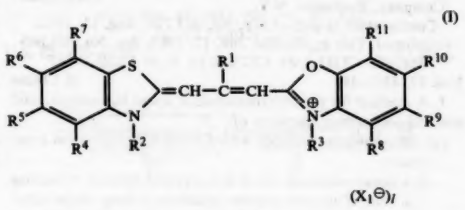
Filed Dec. 20, 1983, Ser. No. 563,488

Claims priority, application Japan, Dec. 22, 1982, 57-225306

Int. Cl.⁴ G03C *1/19*

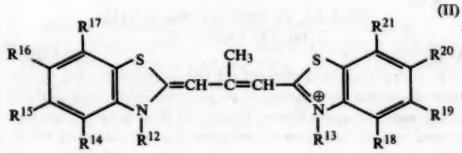
U.S. Cl. 430—574 **9 Claims**

1. A silver halide photographic emulsion, comprising:
a vehicle having dispersed therein:
silver halide particles;
a sensitizing dye having the formula (I);
a sensitizing dye having the formula (II); and
a sensitizing dye having the formula (III);



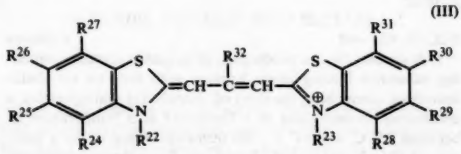
(I)

wherein R^1 is a hydrogen atom or a lower alkyl group; R^2 is an unsubstituted or substituted alkyl group; R^3 is a substituted alkyl group; R^5, R^6, R^9 and R^{10}, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a hydroxy group, an alkoxy group, a carboxy group, an alkoxycarbonyl group or an acylamino group; R^4, R^7, R^8 and R^{11}, which may be the same or different, each represents a hydrogen atom or an alkyl group; R^4 and R^5, R^6 and R^7, R^8 and R^9 or R^{10} and R^{11} may, when taken together, form a benzene ring; $X_1\ominus$ is an acid anion; l is 0 or 1, and when an intramolecular salt is formed, l is 0;



(II)

wherein R^{12} and R^{13} each represents an unsubstituted or substituted alkyl group; R^{15}, R^{16}, R^{19} and R^{20} are the same as R^5, R^6, R^9 and R^{10}, respectively; R^{14}, R^{17}, R^{18} and R^{21} each represents a hydrogen atom or an alkyl group; $X_2\ominus$ is an acid anion; m is 0 or 1, and when an intramolecular salt is formed, m is 0; and



(III)

wherein R^{22} and R^{23} are the same as R^{12} and R^{13}, respectively; R^{25}, R^{26}, R^{29} and R^{30} are the same as R^5, R^6, R^9 and R^{10}, respectively; R^{24}, R^{27}, R^{28} and R^{31} are the same as R^{14}, R^{17}, R^{18} and R^{21}, respectively; $X_3\ominus$ is an acid anion; m is 0 or 1, and when an intramolecular salt is formed, n is 0; R^{32} is a hydrogen atom or a lower alkyl group other than a methyl group.

4,555,483

METHODS, COMPOSITIONS AND ELEMENTS FOR THE DETERMINATION OF LIPASE

Charles M. LiMuti, Hilton; Bruce E. Babb, and John C. Mauck, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 407,214, Aug. 11, 1982, abandoned. This application Jun. 17, 1983, Ser. No. 505,049

Int. Cl.[4] C12Q *1/44;* C12N *9/18, 9/20;* C12R *1/125*

U.S. Cl. 435—19 26 Claims

1. A method for the determination of lipase in a sample, said method comprising the steps of:

(a) contacting said sample with a reagent composition comprising

(i) a lipase substrate which is a glycerol triester oil having in one of its two α-ester positions a long chain alkyl group having at least 8 carbon atoms and, in its two remaining ester positions, short chain alkyl groups such that, if the long chain alkyl group is hydrolyzed, the resulting glycerol diester is water soluble; and

(ii) an esterase enzyme capable of catalyzing the hydrolysis of said water soluble glycerol diester to glycerol; and

(b) detecting the rate at which glycerol is formed.

4,555,484

ANALYTICAL ELEMENT AND METHOD FOR ALKALINE PHOSPHATASE ASSAY

Denise D. LaRossa, Rochester; Allen L. Thunberg, Pittsford; Gary E. Norton, Rochester, and Glen M. Dappen, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 25, 1983, Ser. No. 517,143

Int. Cl.[4] C12Q *1/42*

U.S. Cl. 435—21 20 Claims

1. A dry analytical element for the quantitative determination of alkaline phosphatase in an aqueous liquid, said element comprising a support having therein, in fluid contact, first and second reagent zones, said first reagent zone consisting essentially of a substrate for alkaline phosphatase and said second reagent zone consisting essentially of a buffer which is an alkali metal or ammonium salt and has a pKa in the range of from about 9 to about 11.5.

4,555,485

PRODUCTION OF EDIBLE PROTEIN CONTAINING SUBSTANCES

Robert A. Marsh, Haddenham, England, assignor to Ranks Hovis McDougall, PLC, Berkshire, England

Filed Mar. 26, 1984, Ser. No. 593,473

Claims priority, application United Kingdom, Mar. 24, 1983, 8308162

Int. Cl.[4] C12P *21/00;* C12R *1/77;* A01N *61/00*

U.S. Cl. 435—68 4 Claims

1. A process for the production of an edible protein-containing substance having linear hyphae with little or no chain-branching comprising the steps of; inoculating and operating a continuous fermentation in a fermenter at a temperature of between 25° C. and 34° C., the fermenter being under a pressure of 101 kN/m^2 to 505 kN/m^2, the fermentation occurring at a pH of 3.5 to 7, using Fusarium graminearum schwabe IMI 14525 or variants or mutants thereof, in a culture medium comprising carbohydrate, Mg K, PO_4, Fe, Zn, Mn and Cu ions as growth-promoting substances, all in excess, aerating the fermentation at a flow rate of 0.32 to 1.2 liters per minute per liter volume of the fermenter, such that the oxygen is the limiting nutrient but supports cell concentration in the culture without the occurrence of anaerobic growth, to provide hyphae of longer length with little or no chain-branching.

4,555,486

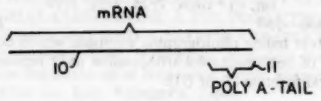
METHOD FOR USING AN AMINO-TERMINUS DNA SEQUENCE TO SYNTHESIZE A SPECIFIC DOUBLE-STRANDED DNA

Chander P. Bahl, El Cerrito, and Jack Nunberg, Oakland, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation of Ser. No. 214,119, Dec. 8, 1980, abandoned. This application Feb. 28, 1983, Ser. No. 468,805

Int. Cl.[4] C12P *21/00, 21/02;* C12N *15/00, 1/00;* C07H *21/04*

U.S. Cl. 435—91 12 Claims



1. A method for constructing double-stranded DNA having a strand which codes for a specific strand of messenger RNA, wherein single strands of a first DNA complementary to the specific strand of messenger RNA are provided, comprising blocking the free 3' hydroxy end of said first complementary DNA, providing at least one specific primer segment comprising a second DNA complementary to a preselected portion of the single strands of said first complementary DNA, said preselected portion of said first complementary DNA being in the region thereof which codes for the amino terminus end of the protein which the messenger RNA encodes and extending said specific primer segment with bases complementary to the single strands of said first DNA to form double-stranded DNA one strand of which codes for the specific strand of messenger RNA.

4,555,487

METHOD FOR CULTIVATION OF PSEUDOMONAS BACTERIA

Hideaki Yamada, Kyoto, and Koitchiro Ryuno, Yokohama, both of Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo and Hideaki Yamada, Kyoto, both of, Japan

Filed Nov. 15, 1983, Ser. No. 551,852

Claims priority, application Japan, Oct. 13, 1983, 58-191637

Int. Cl.[4] C12N *1/20, 9/78;* C12P *13/02;* C12R *1/38*

U.S. Cl. 435—253 3 Claims

1. A method for cultivation of Pseudomonas bacteria which comprises adding at least one amide compound selected from the group consisting of acrylamide, methacrylamide, crotonamide, and n-butyramide to a culture medium in the preparation of cells of bacteria having nitrile hydratase activity by cultivating Pseudomonas bacteria capable of producing nitrile hydratase.

4,555,488

METHOD FOR DETERMINING FLOW PATTERNS IN SUBTERRANEAN PETROLEUM AND MINERAL CONTAINING FORMATIONS USING ORGANONITROGEN TRACERS

Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 353,544, Mar. 1, 1982, Pat. No. 4,420,565, which is a continuation-in-part of Ser. No. 221,692, Dec. 31, 1980, abandoned. This application Dec. 9, 1983, Ser. No. 559,657

Int. Cl.[4] G01N *33/24, 31/08*

U.S. Cl. 436—27 9 Claims

1. The method for determining flow patterns within a subterranean formation penetrated by a spaced apart injection system and a production system, said method comprising injecting into the formation at a predetermined depth in the injection system a solution containing a tracer compound present in sufficient quantity for identification, recovering said solution containing tracer compound in the production system, determining the depth of recovery, and identifying said tracer com-

pounds by gas chromatography and flame ionization detector; said tracer being a volatile water-soluble organic compound containing a hydrocarbon moiety and nitrogen, selected from the group consisting of formamides, acetamides, ureas and thioureas.

4,555,489

METHOD FOR DETERMINING FLOW PATTERNS IN SUBTERRANEAN PETROLEUM AND MINERAL CONTAINING FORMATIONS USING ORGANOSULFUR TRACERS

Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 353,544, Mar. 1, 1982, Pat. No. 4,420,565, which is a continuation-in-part of Ser. No. 221,692, Dec. 31, 1980, abandoned. This application Dec. 9, 1983, Ser. No. 559,658

Int. Cl.[4] G01N *33/24, 31/08*

U.S. Cl. 436—27 **5 Claims**

1. The method for determining flow patterns within a subterranean formation penetrated by a spaced apart injection system and production system, said method comprising injecting into the formation at a predetermined depth in the injection system a solution containing a tracer compound present in sufficient quantity for identification, recovering said solution containing tracer compound in the production system, determining the depth of recovery, and identifying said tracer compounds by gas chromatography and flame ionization detector; said tracer being a volatile water-soluble organic compound containing a hydrocarbon moiety and sulfur, selected from the group consisting of sulfoxides and sulfones; wherein said tracer is injected into an oil containing formation and the tracer does not partition into the oil.

4,555,490

RAPID VISUALIZATION SYSTEM FOR GEL ELECTROPHORESIS

Carl R. Merril, Rockville, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 8, 1984, Ser. No. 618,949

Int. Cl.[4] G01N *21/77, 33/52, 33/68*

U.S. Cl. 436—86 **10 Claims**

1. In a method for separating biopolymer entities by thin membrane or polyacrylamide gel electrophoresis of the type including fixing the separated entities in a suitable fixing medium and thereafter rapidly rinsing the fixed gel with deionized water to remove the fixing medium, the improvement comprising having in said fixing medium about 2% w/v citric acid and about 0.2% w/v sodium chloride; and visualizing said separated entities in less than about 10 minutes by placing said gel or membrane in a single solution photoimaging mixture of 50% v/v methanol, 10% v/v acetic acid and 40% v/v deionized water containing 2% w/v silver nitrate and then uniformly illuminating said gel or membrane with visible light within any chemical treatment.

8. A process for rapid visualization of separated biopolymers on suitable support medium comprising:

(a) immersing said support medium for about 5 min in an aqueous solution consisting essentially of about 50% v/v methanol, about 10% v/v acetic acid and about 40% v/v deionized water containing about 2% w/v citric acid and about 0.2% w/v sodium chloride;

(b) thereafter immediately rinsing said support medium with deionized water to remove surface chloride;

(c) placing said support medium in a a single photoimaging mixture containing about 50% v/v methanol, about 10% v/v acetic acid and 40% v/v of deionized water containing about 2% w/v silver nitrate, wherein imaging of separated biopolymers appears immediately upon placing said support medium in said photoimaging mixture.

4,555,491

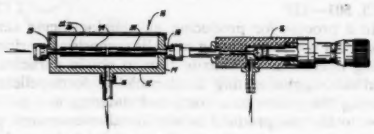
SULFIDE CHEMILUMINESCENCE DETECTION

Stanford R. Spurlin, and Edward S. Yeung, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 31, 1983, Ser. No. 462,532

Int. Cl.[4] G01N *21/76*

U.S. Cl. 436—120 **5 Claims**



1. A method of chemiluminescently determining the presence of a sulfide containing compound in a gas sample where the sulfide containing compound is selected from the group consisting of hydrogen sulfide and methyl mercaptan, comprising:

reacting a gas sample with chlorine dioxide, at a pressure of 40 torr or below, to provide emission of a single photon for every two molecules of sulfide containing compound present in said sample; and

chemiluminescently detecting any photons so emitted as an indication of the presence of said sulfide containing compound.

4,555,492

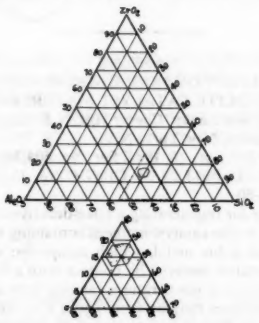
HIGH TEMPERATURE REFRACTORY FIBER

Wendell G. Ekdahl, DeLand, Fla.; Asit R. Chaudhuri, and William C. Miller, both of Littleton, Colo., assignors to Manville Service Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 487,624, Apr. 22, 1983, abandoned. This application Mar. 1, 1984, Ser. No. 585,089

Int. Cl.[4] C03C *3/04, 13/00*

U.S. Cl. 501—38 **2 Claims**



1. A high temperature refractory glass fiber, said fiber in bulk or blanket form exhibiting superior shrinkage resistance of less than 12% when subjected to temperatures up to 2700° F. for about four hours, said refractory fiber having a composition consisting of in percent by weight:

SiO_2	46–52%
Al_2O_3	32–38%
ZrO_2	13–18%

and having a silica to zirconia ratio in the range of from 2.6 to 3.8.

4,555,493

ALUMINOSILICATE CERAMIC PROPPANT FOR GAS AND OIL WELL FRACTURING AND METHOD OF FORMING SAME

David R. Watson, Benton; Val G. Carithers, Little Rock, and L. Thomas McDaniel, Benton, all of Ark., assignors to Reynolds Metals Company, Richmond, Va.

Filed Dec. 7, 1983, Ser. No. 559,048
Int. Cl.[4] B02C *23/00*; C04B *35/16, 35/10*
U.S. Cl. 501—127 2 Claims

1. In a process for producing an aluminosilicate ceramic proppant for use in fracturing of wells comprising performing crushing operations on bauxite clay to obtain particles of a desired size, agglomerating the particles to form pellets, and subjecting the pellets to a combined sintering and calcining process to thereby produce an aluminosilicate ceramic proppant, the improvement wherein the particles to be agglomerated to form the pellets are non-calcined particles, and wherein the process further comprises subjecting the paritcles after crushing and prior to agglomeration to a combined operation involving drying, grinding and air classification so as to remove more dense iron-containing particles from the particles to be agglomerated to form the pellets without the need for magnetic separation.

4,555,494

DIELECTRIC CERAMIC COMPOSITIONS

Masamitsu Nishida, Osaka; Hiromu Ouchi, Toyonaka, and Yoshihiro Matsuo, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 16, 1983, Ser. No. 532,911
Claims priority, application Japan, Sep. 17, 1982, 57-162535; Sep. 17, 1982, 57-162536; Dec. 16, 1982, 57-221403
Int. Cl.[4] C04B *35/00*
U.S. Cl. 501—134 1 Claim

1. A ceramic composition having a dielectric constant of 6380 or higher, and a sintering temperature of 960° C. or lower and consisting essentially of

$$Pb(Mg_{\frac{1}{3}}Nb_{\frac{2}{3}})_x(Zn_{\frac{1}{3}}Nb_{\frac{2}{3}})_y(Fe_{\frac{1}{2}}W_{\frac{1}{2}})_zO_3$$

wherein $0.01 \leqq x \leqq 0.70$, $0.15 \leqq y \leqq 0.45$, $0.05 \leqq z \leqq 0.60$ and $x+y+z=1$.

4,555,495

REACTIVATION OF NOBLE METAL-CONTAINING ZEOLITE CATALYST MATERIALS

Sowmithri Krishnamurthy, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 26, 1984, Ser. No. 604,268
Int. Cl.[4] B01J *29/38*; C10G *47/18, 35/095*
U.S. Cl. 502—50 19 Claims

1. A process for regenerating a coke-deactivated noble metal-containing zeolite catalyst material containing about 0.1 to 5 weight percent noble metal, which comprises: sulfiding said deactivated catalyst material by contact with a hydrogen sulfide-containing gas at temperatures ranging from about 300° C. to 500° C., pressures ranging from about 1 to 500 psig, in the presence of a hydrogen sulfide-hydrogen mixture containing about 0.1 to 10 volume percent hydrogen sulfide, removing coke from the sulfided catalyst by contacting said catalyst with oxygen in the presence of sulfur dioxide under oxidizing conditions, wherein said oxidizing conditions include temperatures ranging from about 100° to 500° C., pressures ranging from about 100 to 400 psig, and exposure to a gas stream containing about 100 ppm to 2 volume percent SO_2 and about 1 to 10 volume percent O_2, and exposing the resulting catalyst material to hydrogen under reducing conditions comprising temperatures ranging from about 300° to 500° C., pressures ranging from about 100 to 400 psig, and contact times ranging from about 2 to 10 hours.

2. The process of claim 1 wherein said sulfiding temperatures range from about 350° to 450° C., said sulfiding pressures range from about 150 to 250 psig and said mixture contains about 2 volume percent hydrogen sulfide.

3. The process of claim 1 wherein said oxidizing temperatures range from about 400° to 450° C., and said oxidizing gas stream contains about 0.05 to 1 volume percent sulfur dioxide and about 1 to 3 volume percent oxygen.

4,555,496

SUPPORTED POLYOLEFIN CATALYST COMPONENTS AND METHODS OF MAKING AND USING THE SAME

Agapios Agapiou, Humble, Tex.; John L. H. Allan, Glenrock, and Felix I. Jacobson, Westwood, both of N.J., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 409,041, Aug. 20, 1982, abandoned.
This application May 31, 1984, Ser. No. 615,882
Int. Cl.[4] C08F *4/62, 4/64, 4/68*
U.S. Cl. 502—105 52 Claims

1. A method of producing a polymerization catalyst component suitable for use in the polymerization of alpha-olefins, which method comprises:

heating in an inert hydrocarbon solvent an active component formed by co-comminuting an inorganic Lewis acid, a first organic electron donor, a support base selected from the group consisting of the Group IIA and IIIA salts and the salts of the multivalent metals of the first transition series with the exception of copper, and a polymerization active tri- and tetra-, or penta- valent transition metal compound of a Group IVB–VIB metal, said heating being at a temperature of between about 40° to 150° C. for a period of between about 1–24 hours to produce the polymerization catalyst.

4,555,497

TITANIUM COMPLEXES AND CATALYSTS PREPARED THEREFROM

William M. Coleman, III, Lake Jackson, and Morris S. Edmondson, Alvin, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 26, 1984, Ser. No. 665,336
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—115 19 Claims

13. A catalyst composition resulting from reacting in an inert hydrocarbon medium

(A) at least one hydrocarbon soluble organomagnesium component represented by the formula $MgR''_{2}xMR''_{y}$ wherein each R'' is independently a hydrocarbyl group having from 1 to 20 carbon atoms; M is a metal selected from Al, Zn, Si, Sn, B and P; y has a number corresponding to the valence of M and x has a value from about 0.001 to about 10;

(B) a sufficient quantity of at least one halide source so as to convert all of the organic groups attached to a magnesium atom in component (A) to a halide group; said halide source being selected from

(1) an active non-metallic halide, said non-metallic halide corresponding to the formula R'X wherein R' is hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms and such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen; or

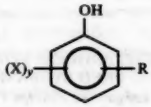
(2) a metallic halide corresponding to the formula $MR_{y-a}X_a$ wherein M is a metal of Group IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl group having from 1 to about 20 carbon atoms, X is halogen, y is a number corresponding to the valence of M and a is a number from 1 to y;

(C) at least one titanium compound represented by the formula $Ti(OR)_xX_{4-x}$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms; X is a halogen and x has a value from zero to 4;

(D) a mixture comprising

(1) from about 2.5 to about 97.5 mole percent of at least

one compound containing at least one aromatic hydroxyl group represented by the following formulas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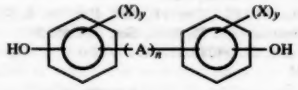
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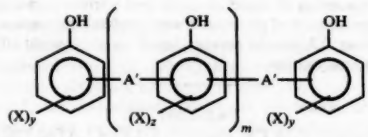
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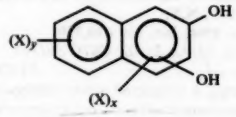
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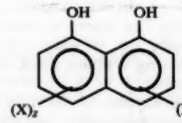
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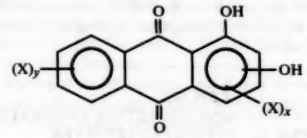
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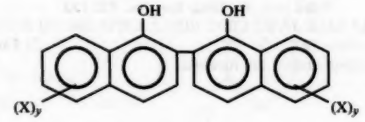
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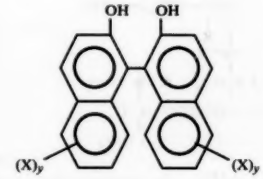
VIII.

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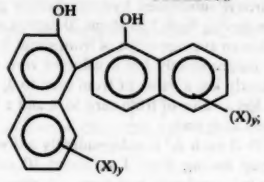
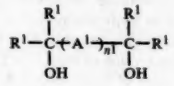
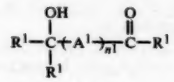
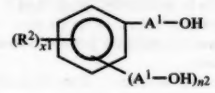

IX.

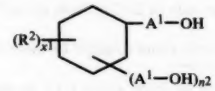
and

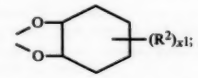
(2) from about 2.5 to about 97.5 mole percent of at least one compound having at least one aliphatic hydroxyl group represented by the following formulas


X.


XI.

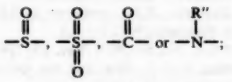

XII.


XIII.


XIV.

wherein components (C) and (D) are employed in quantities which provide a molar ratio of D:C of from about 0.1:1 to about 10:1 and wherein

(a) in component (D-1) each A is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms, —O—, —S—, —S—S—,



each A′ is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each R is independently —OH,

or a hydroxyl substituted hydrocarbyl or a hydroxyl substituted hydrocarbyloxy group having from 1 to about 20 carbon atoms; each R′ is independently hydrogen, hydroxyl or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms; each R″ is independently hydrogen or a hydrocarbyl group having from 1 to about 10 carbon atoms; each X is independently a hydroxyl group, a nitro group, a nitrile group, a hydrocarbyl group,

a hydrocarbyloxy group, a hydroxyl substituted hydrocarbyl or a hydroxyl substituted hydrocarbyloxy group each such groups having from 1 to about 20 carbon atoms or a halogen; m has an average value of from about 0.01 to about 6; each n independently has a value of zero or 1; each x independently has a value of from zero to 2; each y independently has a value of from zero to 4; and z has a value of from zero to 3; and

(b) in component (D-2) each A^1 is independently a divalent hydrocarbyl group having from 1 to about 10 carbon atoms; each R^1 is independently hydrogen, a hydrocarbyl group or a halogen, nitro or hydrocarbyloxy substituted hydrocarbyl group, each such hydrocarbyl or hydrocarbyloxy groups having from 1 to about 20 carbon atoms; each R^2 is independently hydrogen, a halogen atom, a hydrocarbyl group, a hydrocarbyloxy group or a halogen, nitro or hydrocarbyloxy substituted hydrocarbyloxy group, each such hydrocarbyl or hydrocarbyloxy groups having from 1 to about 20 carbon atoms; each n^1 is independently zero or 1; each n^2 has a value of from 1 to 5, and each x^1 independently has a value of from zero to 4;

and when components (A) and/or (B) do not contain or contain an insufficient quantity of aluminum, then

(E) an aluminum compound represented by the formula $AlR_{y'}X_{y''}$ wherein R is a hydrocarbyl group having from 1 to about 10 carbon atoms; X is halogen and y' and y'' each have a value of from zero to three with the sum of y' and y'' being three is employed;

and wherein the components are employed in quantities so as to provide the following ratios:

(1) a Mg:Ti atomic ratio of from about 1:1 to about 200:1,

(2) components (D) and (C) are employed in quantities which provide a molar ratio of D:C of from about 0.1:1 to about 10:1;

(3) excess X:Al ratio of from about 0.0005:1 to about 10:1; and

(4) an Al:Ti atomic ratio of from about 0.1:1 to about 2000:1.

4,555,498

PREPARATION OF CERTAIN ALKALINE EARTH METAL ORGANOMETALLIC COMPOUNDS

Conrad W. Kamienski, Gastonia, N.C., assignor to Lithium Corporation of America, Gastonia, N.C.

Continuation-in-part of Ser. No. 551,917, Nov. 15, 1983, abandoned. This application Nov. 8, 1984, Ser. No. 669,675

Int. Cl.[4] C08F *4/48, 4/50;* C07C *31/30*

U.S. Cl. 502—153 **30 Claims**

21. An organometallic complex composition soluble in volatile liquid solutions of hydrocarbon or chlorinated hydrocarbon solvents comprising at least one member of the group of alkyllithiums, dialkylmagnesium and trialkylaluminums, reacted with a volatile hydrocabon or chlorinated hydrocarbon solvent solution of an alkoxide resulting from the reaction of a suspension of a metal or an amide of calcium, strontium or barium, or a dialkylmetallic compound thereof and with an alcohol as such or in solution in a volatile liquid hydrocarbon or chlorinated hydrocarbon, said alcohol being selected from the group of (a) aliphatic 2-alkyl-substituted C_4–C_{12} monohydric primary alcohols, and (b) mixtures of said (a) alcohols with C_3–C_{12} aliphatic secondary monohydric alcohols in which the hydroxyl group is attached to the second carbon atom, said composition being substantially free from ammonia.

4,555,499

CATALYST FOR DEMETALLIZATION OF HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes, and James B. Kimble, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 485,792, Apr. 18, 1983, abandoned. This application Feb. 1, 1984, Ser. No. 576,079

Int. Cl.[4] B01J *27/14*

U.S. Cl. 502—208 **7 Claims**

1. A catalyst composition comprising zirconium phosphate, cobalt phosphate and vanadium phosphate.

4,555,500

CATALYST FOR HYDROFINING PROCESS FOR HYDROCARBON-CONTAINING FEED STREAMS

Simon G. Kukes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 619,661, Jun. 11, 1984, Pat. No. 4,492,626. This application Oct. 29, 1984, Ser. No. 665,843

Int. Cl.[4] B01J *21/04, 23/42*

U.S. Cl. 502—334 **4 Claims**

1. A catalyst composition consisting essentially of an alumina support, platinum and a promoter selected from the group consisting of scandium oxide and yttrium oxide, where the concentration of platinum in said catalyst composition is at least about 0.3 weight percent based on the weight of said catalyst composition.

4,555,501

PROCESS FOR PREPARING SILVER CATALYSTS

William D. Armstrong, Stamford, Conn., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed May 14, 1984, Ser. No. 610,229

Int. Cl.[4] B01J *29/00, 31/12, 23/02;* C07D *301/04*

U.S. Cl. 502—243 **14 Claims**

1. A process for preparing a supported silver catalyst suitable for the oxidation of ethylene to ethylene oxide comprising:

(a) impregnating a support with a hydrocarbon solution of a silver salt of a neo-acid having 7 or more carbon atoms, said solution being substantially free of water and said neo-acid, said support comprising alumina, silica, silica-alumina or combinations thereof;

(b) separating the impregnated support of (a) from said solution and heating said separated support in the presence of molecular oxygen for a period of time sufficient to produce an active silver catalyst containing up to about 15 wt. percent silver.

4,555,502

AMINOACYL-CONTAINING DIPEPTIDE DERIVATIVES USEFUL AS ANTIHYPERTENSIVES

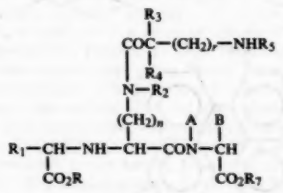
Arthur A. Patchett, Westfield, and Mu T. Wu, Clark, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 30, 1982, Ser. No. 425,133

Int. Cl.[4] A61K *37/00;* C07C *103/52;* C07D *209/20, 209/18*

U.S. Cl. 514—19 **21 Claims**

1. A compound of the formula:



I

wherein:

R and R_7 are independently hydrogen, loweralkyl, aryl, aralkyl;

R^1 is hydrogen; alkyl of from 1–12 carbon atoms which include branched and unsaturated groups and cyclic groups of 3–9 carbon atoms; substituted lower alkyl of 2–8 carbon atoms wherein the substituent(s) are halo, hydroxy, carboxy, carboxamido, loweralkylthio, loweralkoxy, loweralkoxycarbonyl, arylthio, aryloxy, aralkylthio, aralkyloxy, amino, loweralkylamino, diloweralkylamino, arylamino, arloweralkylamino, acylamino, acyl loweralkylamino, acyl arylamino, acyl aralkylamino, =O, =S or ureido; benzofused cycloalkyl and bicycloalkyl of 8 to 12 carbon atoms which can be substituted by one or more of the foregoing substituents; aryl, arloweralkyl, heteroaryl, heteroarloweralkyl, and those groups substituted by one or more of the foregoing substituents, the aryl or heteroaryl portions thereof being optionally mono-, di- or trisubstituted by halo, loweralkyl, hydroxy, loweralkoxy, amino, aminoloweralkyl, substituted aminoloweralkyl, hydroxyloweralkyl, acylamino, carboxy, halolower alkyl, nitro, cyano or sulfonamido; all of said foregoing substituents containing an aryl or heteroaryl group in which the aromatic rings are partially or completely hydrogenated;

n is 1 to 5;

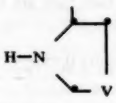
r is 0 to 3;

R_2 is hydrogen, loweralkyl;

R_3 is hydrogen, aryl, hydroxyaryl, loweralkyl, loweralkyl substituted with aryl, carboxy, heteroaryl, amino, hydroxy, guanidino, alkylthio, mercapto, or alkyloxy;

R_4 and R_5 are independently hydrogen, loweralkyl; or,

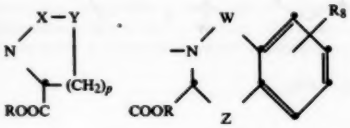
R_3 and R_5 can be joined to form a 5- to 6-membered ring having the formula:

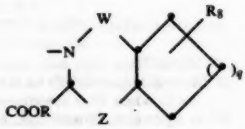


wherein V is $-CH_2CH_2-$, $-CH_2-$, S, $-CH(OR_2)-$ and wherein R_2 is the same as defined above;

A is loweralkyl, C_3–C_8 cycloalkyl; C_8–C_{12} bicycloalkyl; benzofused C_3–C_8 cycloalkyl; perhydrobenzofused C_3–C_8 cycloalkyl; aryl; aralkyl; heteroaryl; heteroaralkyl; perhydroheteroaryl, or perhydroheteroaralkyl; all of which can be substituted by loweralkyl, loweralkoxy, halo, hydroxy, amino or acylamino;

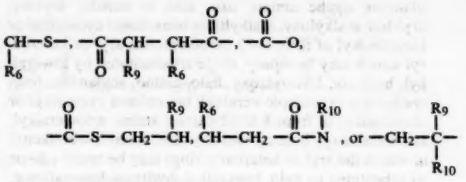
B is hydrogen or loweralkyl; or, A and B can be joined, together with the N and C atoms to which they are attached to form a ring having the formulae





wherein:

X and Y taken together are $-CH_2-CH_2-$,



wherein R_6 is hydrogen or loweralkyl;

R_9 is hydrogen; lower alkyl; cycloalkyl; aryl; aralkyl; heteroaryl; heteroaralkyl; loweralkyloxy; loweralkylthio; aryloxy; arylthio; arloweralkyloxy; arloweralkylthio; acyloxy; amino; mono- or disubstituted loweralkylamino and arloweralkylamino; heteroarloweralkylamino; acylamino in which the acyl group can be loweralkanoyl, arloweralkanoyl, aroyl, heteroaroyl, heteroarloweralkanoyl; carbamoyloxy; or, N-substituted carbamoyloxy; the aromatic ring in said foregoing substituents being optionally mono-, di- or trisubstituted by loweralkyl, loweralkoxy, hydroxy, amino, loweralkylthio, halo, lowerhydroxyalkyl, loweraminoalkyl, sulfonamido, cyano, nitro, aryl, aryloxy, arylthio, or aralkyl; the aromatic rings in said groups containing aryl or heteroaryl groups being completely or partially hydrogenated;

R_{10} is hydrogen; loweralkyl; aryl; substituted aryl; aralkyl; or, cycloalkyl; or R_9 and R_{10} taken together can form a 5 or 6 membered ring which can contain 0, 1 or 2 S or O atoms;

p is 1 to 3;

q is 1 to 3;

W is absent; $-CH_2$, or

Z is $-(CH_2)_m-$ wherein m is 0 to 2 provided that m is not 0 when W is absent;

R_8 is hydrogen; loweralkyl; loweralkoxy; hydroxy, halo; loweralkylthio; or, amino; and, the pharmaceutically acceptable salts thereof.

4,555,503

N^2-(SUBSTITUTED)CARBOXYMETHYL-N^6-(SUBSTITUTED)-LYSYL-AND α-(ε-AMINOALKYL)GLYCYL AMINO ACID ANTIHYPERTENSIVE AGENTS

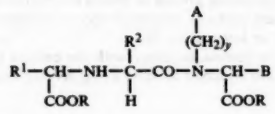
Arthur A. Patchett, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 374,834, May 5, 1982, abandoned. This application Feb. 18, 1983, Ser. No. 466,622

Int. Cl.[4] A61K *37/00*; C07C *103/52*

U.S. Cl. 514—19 **22 Claims**

1. A compound of the formula:



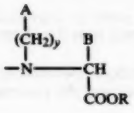
(I.)

wherein:

R is hydrogen; loweralkyl; aralkyl; or, aryl;

R^1 is hydrogen; alkyl of from 1 to 12 carbon atoms which include branched, cyclic and unsaturated alkyl groups; substituted loweralkyl wherein the substituent can be halo, hydroxy, carboxy, carboxamido, loweralkylthio, loweralkoxy, loweralkoxycarbonyl, loweraralkoxycarbonyl, amino, loweralkylamino, lowerdialkylamino, acylamino; substituted loweralkylamino, wherein the substitu-

ent can be halo, hydroxy, alkoxy or cyano; arloweralkylamino; cyclic amino; oxo, thio or ureido; aryloxy; arylthio; aralkyloxy; aralkylthio; benzofused cycloalkyl or bicycloalkyl of from 8–12 carbon atoms; aryl or heteroaryl which may be mono-, di- or trisubstituted by loweralkyl, hydroxy, loweralkoxy, halo, amino, acylamino, loweralkylthio or aminoloweralkyl; benzofused cycloalkyl or bicycloalkyl of from 8 to 12 carbon atoms; arloweralkyl; arloweralkenyl; heteroloweralkyl and heteroloweralkenyl in which the aryl or heteroaryl rings may be mono-, di- or tri-substituted by halo, loweralkyl, hydroxy, loweralkoxy, amino, loweralkylamino, diloweralkylamino, aminoloweralkyl, acylamino, carboxy; halololoweralkyl, nitro, cyano or sulfonamido; aralkyl or heteroaralkyl which include branched loweralkyl groups; substituted aralkyl or substituted heteroaralkyl which include branched loweralkyl groups wherein the loweralkyl groups can be substituted by amino, acylamino, or hydroxyl and the aryl and heteroaryl groups can be substituted by halo, dihalo, loweralkyl, hydroxy, loweralkoxy, aryloxy, aroyl, arylthio, amino, aminoloweralkyl, loweralkanoylamino, aroylamino, lowerdialkylamino, loweralkylamino, hydroxy, hydroxyloweralkyl, trihalololoweralkyl, nitro, cyano, or sulfonamido; any of the arloweralkyl or alkenyl and heteroloweralkyl or alkenyl groups described above in which the aryl or heteroaryl ring is partially or completely hydrogenated; substituted loweralkyl having the formula $R_A^1(CH_2)_n$-Q-$(CH_2)_m$ wherein n is 0–2, m is 1–3, R_A^1 is aryl or heteroaryl optionally substituted by amino, lowerdialkylamino, loweralkylamino, hydroxy, hydroxyloweralkyl, aminoloweralkyl, trihaloloweralkyl, cyano, nitro, sulfonamido, aroyl, loweralkyl, halo, dihalo, and loweralkoxy, and Q is O, S, SO, SO_2, N—R_B^1, $CONR_C^1$, NR_C^1CO, CH=CH wherein R_B^1 is hydrogen, loweralkyl, aryl, aralkyl, loweralkanoyl, or aroyl, and R_C^1 is hydrogen, or loweralkyl; in the group:



y is 0 to 4;

A is

(a) alkyl, including branched unsaturated and cyclic alkyl of 3 to 8 carbon atoms;

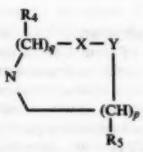
(b) benzofused cycloalkyl or bicycloalkyl of 8 to 12 carbon atoms;

(c) aryl or heteroaryl groups which may be mono-, di- or trisubstituted by loweralkyl; loweralkoxy, halo, amino, acylamino, hydroxy, acyl or acyloxy, and corresponding groups in which the aryl or heteroaryl groups are partially or completely hydrogenated;

(d) loweralkyl including branched and unsaturated groups which may be substituted by aryl or heteroaryl groups and corresponding groups in which the aryl or heteroaryl rings are partially or completely hydrogenated;

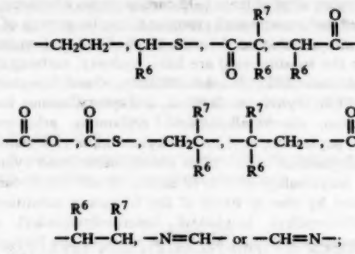
B is hydrogen or loweralkyl; or

A and B may be joined, together with the carbon atoms to which they are attached to form a ring having the formulae:



(1)

wherein X and Y taken together are

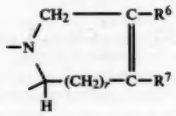


R^3 and R^6 individually are hydrogen; loweralkyl; cycloalkyl; aryl; aralkyl; heteroaryl; loweralkyloxy; loweralkylthio; aryloxy; arylthio; arloweralkyloxy; arloweralkylthio; hydroxy; acyloxy; acylloweralkyl; halo; amino; mono- or disubstituted loweralkylamino; arloweralkylamino; heteroloweralkylamino acylamino in which the acyl group may be loweralkanoyl, aroyl, heteroaroyl or heteroloweralkanoyl; carbamoyl or N-substituted carbamoyloxy; including any of these groups containing an aromatic ring wherein said ring may be mono-, di- or trisubstituted by loweralkyl, loweralkoxy, loweralkylthio, halo, hydroxy, aryl, aryloxy, arylthio or aralkyl; any of the groups recited above containing an aryl or heteroaryl group in which these groups are partially or completely hydrogenated;

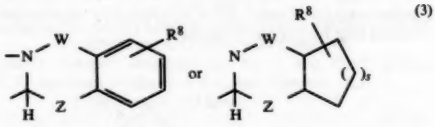
R^7 is hydrogen, loweralkyl, cycloalkyl, aryl, substituted aryl wherein the substituent can be halo, hydroxy, alkoxy, amino or loweralkyl; or

R^6 and R^7 taken together may be oxo or together with the carbon atoms to which they are attached form a 3 to 6 membered ring which may contain 0, 1 or 2 atoms of N, S or O;

p and q are independently 0 to 3;



wherein R^6 and R^7 are as defined above and r is 0, 1 or 2;



(3)

wherein:

W is absent; —CH_2—;

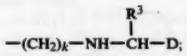
N; or S;

Z is —$(CH_2)_t$, wherein t is 0 to 2, provided that m may not be O when W is absent; —O—; —N—, or —S—.

R^8 is hydrogen; loweralkyl; loweralkoxy; hydroxy; halo; loweralkylthio; amino; acylamino; or cyano;

s is 1 to 3;

R^2 is



where k is 2 to 5; R^3 is hydrogen; loweralkyl and substituted loweralkyl where the substituents are carboxy, hydroxy, and amino; or aralkyl, substituted aralkyl, heteroaralkyl, and substituted heteroaralkyl where the aryl and heteroaryl substituents are carboxy, hydroxy, and amino; and D is COOR; $CONH_2$; or CH_2OH; and a pharmaceutically acceptable salt thereof.

4,555,504

INCLUSION COMPLEX OF β-CYCLODEXTRIN AND DIGOXIN

Harry P. Jones, Erith, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 341,236, Jan. 21, 1982, abandoned. This application Mar. 12, 1984, Ser. No. 589,035

Claims priority, application United Kingdom, Jan. 23, 1981, 8102124

Int. Cl.⁴ A61K *31/70*

U.S. Cl. 514—26 **7 Claims**

1. A pharmaceutical composition comprising a nontoxic, effective cardiac dysfunction treatment amount of an inclusion complex of β-cyclodextrin and digoxin together with a pharmaceutically acceptable carrier therefor.

4,555,505

METHOD FOR THE TREATMENT OF HYPERGLYCEMIA USING P-AMINOBENZOATE-N-L-RHAMNOSIDE

Chikao Yoshikumi, Tokyo; Yoshio Ohmura, Funabashi; Fumio Hirose, Tokyo; Masanori Ikuzawa, Tokyo; Kenichi Matsunaga, Tokyo; Takayoshi Fujii, Tokyo; Minoru Ohara, Tokyo, and Takao Ando, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 484,592, Apr. 13, 1983, which is a continuation-in-part of Ser. No. 289,226, Aug. 3, 1981, abandoned, which is a division of Ser. No. 102,535, Dec. 11, 1979, Pat. No. 4,313,939, which is a continuation-in-part of Ser. No. 39,218, May 15, 1979, abandoned. This application Feb. 29, 1984, Ser. No. 584,629

Claims priority, application Japan, May 26, 1978, 53-63146; Dec. 29, 1978, 53-161385; Dec. 29, 1978, 53-161386

Int. Cl.⁴ A61K *31/70*

U.S. Cl. 514—42 **4 Claims**

1. A method for the treatment of hyperglycemia, which comprises administering to a patient suffering therefrom a pharmaceutically effective amount of p-aminobenzoate-N-L-rhamnoside or a pharmaceutically acceptable salt thereof.

4,555,506

PHOSPHORUS CONTAINING COMPOUNDS AND USE AS HYPOTENSIVES

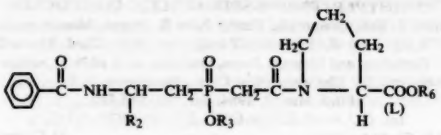
Donald S. Karanewsky, Princeton Junction, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 24, 1981, Ser. No. 334,271

Int. Cl.⁴ C07F *9/65*; A61K *31/40*

U.S. Cl. 514—91 **7 Claims**

1. A compound of the formula

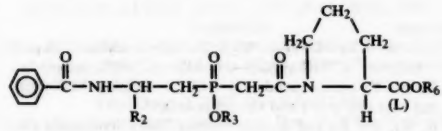


wherein

R_2 is phenylmethyl; and

R_3 and R_6 are the same and each is hydrogen, sodium, potassium, or lithium.

3. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and a hypotensive agent or pharmaceutically acceptable salt thereof of the formula



wherein R_2, R_3 and R_6 are as defined in claim 1.

4. The method of alleviating hypertension in a mammalian specie which comprises administering an effective amount of the composition of claim 3.

4,555,507

NOVEL 6, 16-DIMETHYLCORTICOIDS, THEIR PREPARATION AND USE

Klaus Annen; Henry Laurent; Helmut Hofmeister; Rudolf Wiechert; Michael Töepert, and Hans Wendt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

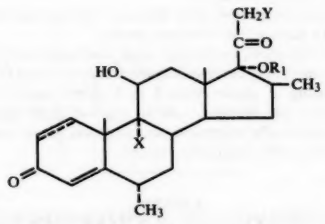
Filed Jul. 19, 1983, Ser. No. 515,243

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1982, 3227312

Int. Cl.⁴ C07J *5/00*

U.S. Cl. 514—172 **16 Claims**

1. A 6,16-dimethylcorticoid of the formula



wherein

===== represents a single bond or a double bond;

X is hydrogen, flourine, chlorine, or bromine;

R_1 is formyl, alkanoyl or alkoxyalkyl, each of 2–8 carbon atoms, or benzoyl; and

Y is formyl.

8. A method of treating inflammation in a patient in need of such treatment comprising administering to the patient an anti-inflammatorily effective amount of a compound of claim 1.

4,555,508

ANTIHYPERTENSIVE SPIRO-CYCLIC COMPOUNDS

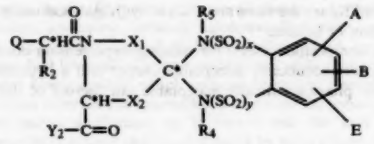
John T. Suh, Greenwich, Conn.; John R. Regan, Mamaroneck, N.Y.; John J. Piwinski, Parsippany, N.J.; Paul Menard, Tuckahoe, and Howard Jones, Ossining, both of N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,697

Int. Cl.[4] A61K *37/00;* **C07D** *279/00;* **C07C** *103/52*

U.S. Cl. 514—211 **23 Claims**

1. A compound of the formula



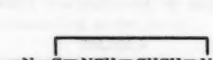
wherein

Q is Y_1—C(O)—C*H(R_1)—NH—, —NH_2, R_1—C(O)—S—(C*H(R_1))$_{0-1}$—, or HS—(C*H(R_1))$_{0-1}$—;

Y_1 and Y_2 are independently —OH, —OR, or —NR_1R_2;

one of x and y is 1 and the other is 0;

R, R_1, R_2, R_4 and R_5 are independently hydrogen, alkyl having 1 to 8 carbon atoms, aryl having up to 12 carbon atoms, aryl-alkyl wherein the aryl moiety has up to 10 carbon atoms and the alkyl moiety has 1 to 6 carbon atoms, cycloalkyl having 3 to 10 carbon atoms, fused cycloalkylaryl having 8 to 12 carbon atoms, heterocyclic, or an alkyl group having 1 to 6 carbon atoms which is substituted with —NH_2, [—NH—C(=NH_2)=NH_2]—*N-H—C(NH$_2$)*=NH, or [—N—C=NCH=CHCH=N]



A, B and E are independently hydrogen, halogen, hydroxy, —CF_3, —OR, —NR^1R_2, —C(O)Y_1, —SO_2R, or —$SO_2NR_1R_2$ provided that at least two of A, B and E are not hydrogen;

X_1 is —$(CH_2)_a$—, —$(CH_2)_b$S$(CH_2)_c$—, —$(CH_2)_b$C(O)$(CH_2)_c$—, or —$(CH_2)_b$CH(R_3)$(CH_2)_c$—;

X_2 is —$(CH_2)_d$—, —$(CH_2)_e$S$(CH_2)_f$—, —$(CH_2)_e$C(O)$(CH_2)_f$—, or —$(CH_2)_e$CH(R_3)$(CH_2)_f$—;

provided that a is 0–4, b is 0–3, c is 0–3, d is 0–4, e is 0–3, f is 0–3, (a+d) is 2–4, (a+e+f) is 1–3, (b+c+d) is 1–3, and (b+c+e+f) is 0–2; and

R_3 is hydroxy, phenyl, alkyl having 1 to 6 carbon atoms, or alkoxy having 1 to 6 carbon atoms;

wherein the alkyl, cycloalkyl, aryl, and fused aryl-cycloalkyl groups may carry substituents selected from the group consisting of alkoxy with 1 to 6 carbon atoms, —CF_3, —OH, —SH, halogen, —NO_2, and —COOR; and

pharmaceutically acceptable acid addition, alkali metal, and alkaline earth metal salts thereof.

4,555,509

ANTI-HYPERTENSIVE BENZO[b]PYRAN-3-OLS

John M. Evans, Roydon; Robin E. Buckingham, Welwyn Garden City, and Kenneth Willcocks, Harlow, all of England, assignors to Beecham Group p.l.c., England

Filed Mar. 22, 1984, Ser. No. 592,117

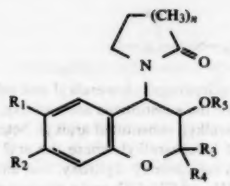
Claims priority, application United Kingdom, Mar. 24, 1983, 8308063

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/445, 31/40;* **C07D** *405/04*

U.S. Cl. 514—278 **11 Claims**

1. A compound of formula (I):



(I)

wherein:

one of R_1 and R_2 is hydrogen and the other is C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, 1-mercapto C_{2-7} alkyl or formyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl, or R_3 and R_4 together with the carbon atom to which they are attached are C_{3-6} spiroalkyl;

R_5 is hydrogen, C_{1-3} alkyl or C_{1-8} acyl; and

n is 1 or 2; the lactam group being trans to the OR_5 group.

10. A method of treating or preventing hypertension in animal including humans which comprises administering to the patient an anti-hypertensive effective amount of a compound according to claim **1**.

4,555,510

THERAPEUTIC AGENT FOR HYPERTENSION

Kazuhiro Goto, Nakatsu; Osamu Yaoka, Fukuoka, and Takanori Oe, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP82/00425, § 371 Date Jun. 27, 1984, § 102(e) Date Jun. 27, 1984, PCT Pub. No. WO84/01711, PCT Pub. Date May 10, 1984

PCT Filed Oct. 30, 1982, Ser. No. 626,837

Int. Cl.[4] A61K *31/435*

U.S. Cl. 514—291 **2 Claims**

1. A method of treating a human afflicted with hypertension, which comprises orally administering to the human a therapeutically effective amount of a compound selected from the group consisting of 9-chloro-5-oxo-7-(1H-tetrazol-5-yl)-5H-[1]benzopyrano[2,3-b]pyridine, a pharmaceutically effective salt thereof and the sodium salt.penta hydrate thereof.

4,555,511

THIENO [3,2,C]PYRIDINES USEFUL AS ANTIHYPERTENSIVES

Gerd Schnorrenberg, Ingelheim am Rhein; Otto Roos, Schwabenheim; Walter Lösel; Ingrid Wiedemann, both of Gau-Algesheim; Wolfram Gaida, Ingelheim am Rhein, and Wolfgang Hoefke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

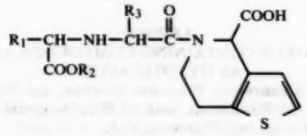
Filed Jan. 19, 1984, Ser. No. 572,179

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302125

Int. Cl.[4] C07D *513/02*

U.S. Cl. 514—301 **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl(alkyl of 1 to 6 carbon atoms);

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl(alkyl of 1 to 6 carbon atoms);

R_3 is hydrogen or alkyl of 1 to 6 carbon atoms; or a non-toxic, pharmaceologically acceptable salt thereof.

6. An antihypertensive pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antihypertensive amount of a compound of claim 1.

4,555,512

CIRCULATION-ACTIVE NOVEL CHROMONE- AND THIOCHROMONE-SUBSTITUTED 1,4-DIHYDROPYRIDINE-LACTONES

Siegfried Goldmann; Friedrich Bossert, both of Wuppertal; Matthias Schramm, Cologne; Günter Thomas, and Rainer Gross, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

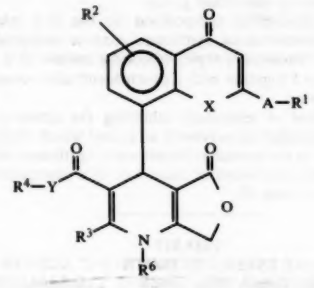
Filed Mar. 14, 1984, Ser. No. 589,614

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3311003

Int. Cl.[4] A61K *31/435;* **C07D** *491/048*

U.S. Cl. 514—302 **13 Claims**

1. A dihydropyridine of the formula



(I)

in which

R^1 represents hydrogen, a straight-chain, cyclic or branched aliphatic hydrocarbon radical with 1 to 10 C atoms, a carboxylic acid alkyl ester with an alkyl radical of 1 to 10 C atoms, an aromatic or a heteroaromatic radical which optionally can be substituted by one to 5 identical or different substituents from the group comprising halogen, C_1–C_{10}-alkyl, C_1–C_{10}-alkoxy, C_1–C_{10}-alkylthio, C_1–C_{10}-alkylsulphinyl, cyano, hydroxyl, nitro, mono- or poly-fluoro-C_1–C_5-alkyl, mono- or poly-fluoro-C_1–C_5-alkoxy, mono- or poly-fluoro-C_1–C_5-alkylthio, amino, mono-C_1–C_5-alkylamino and di-C_1–C_5-alkylamino,

R^2 represents one to three halogen atoms or hydrogen,

R^4 represents a straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical with 1 to 20 C atoms, which is optionally substituted by alkoxy with 1 to 10 C atoms, alkylthio with 1 to 10 C atoms, alkylsulphinyl with 1 to 10 C atoms, trialkylsilyl with in each case 1 to 6 atoms, halogen, cyano, hydroxyl, amino, alkylamino with 1 to 6 C atoms, dialkylamino with in each case 1 to 6 C atoms, morpholinyl, piperidyl, piperazinyl, nitro, nitrate, aryl or heteroaryl either of which can optionally be substituted by 1 to 3 identical or different substituents from the group comprising halogen, alkyl with 1 to 6 C atoms, alkoxy with 1 to 6 C atoms, alkylthio with 1 to 6 C atoms, alkylsulphinyl with 1 to 6 C atoms, alkylsulphonyl with 1 to 6 C atoms, hydroxyl, cyano, nitro, amino, alkylamino with 1 to 6 C atoms, dialkylamino with in each case 1 to 6 C atoms, mono- or poly-fluoroalkyl with 1 to 6 C atoms and mono- or poly-fluoroalkoxy with 1 to 6 C atoms,

R^5 represents hydrogen or a straight-chain, branched or cyclic, saturated or unsaturated aliphatic alkyl radical with 1 to 10 C atoms, which optionally contains one or two identical or different hetero chain members from the group comprising O, CO, NH, N-alkyl with 1 to 8 C atoms, S and SO_2, and is optionally substituted by halogen, nitro, cyano, azido, hydroxyl, aryl, heteroaryl, amino or monoalkylamino or dialkylamino with in each case 1 to 6 C atoms,

R^6 represents hydrogen or a straight-chain or branched C_1–C_{20}-alkyl radical, which is optionally substituted by C_1–C_{10}-alkoxy, halogen or morpholino,

A represents a direct bond, a C_1–C_{20}-alkylene chain or a C_2–C_{20}-alkenylene chain, which chains are optionally interrupted by O or S,

X represents O or S and

Y represents a direct bond, O, S, —NH— or —N— alkyl with 1 to 8 C atoms,

or a pharmaceutically acceptable salt.

4,555,513

1,2 DIHYDRO- AND 1,2,3,4-TETRAHYDRO QUINOLYLACETIC ACIDS AND ANALGESIC USE THEREOF

Masaaki Hamada; Kaoru Okamaoto, and Teikichi Kurosaki, all of Osaka, Japan, assignors to Nippon Zoki Pharmaceutical Co., Osaka, Japan

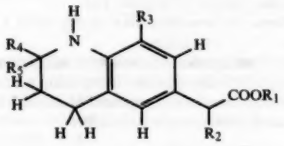
Filed Dec. 22, 1982, Ser. No. 452,146

Claims priority, application Japan, Dec. 29, 1982, 56-211626

Int. Cl.[4] A61K *31/47;* **C07D** *215/06*

U.S. Cl. 514—311 **19 Claims**

1. A quinolylacetic acid compound of the general formula (I)



(I)

wherein:

R_1 is hydrogen or an alkyl group having 1 to 4 carbon atoms;

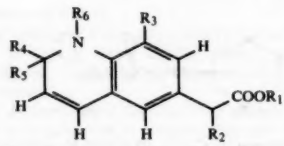
R_2 is an alkyl group of 1 to 4 carbon atoms;

R_3 is a halogen, an alkyl group having 1 to 8 carbon atons, or an alkenyl group having 2 to 8 carbon atons; and

R_4 and R_5 are each an alkyl group having 1 to 4 carbon atoms or R_4 and R_5 can form a carbocyclic ring having 3 to 6 carbon atoms;

and pharmaceutically acceptable salts thereof.

7. A quinolylacetic acid compound of general formula (II)



(II)

wherein:

R_1 is hydrogen or an alkyl group having 1 to 4 carbon atoms;

R_2 is an alkyl group of 1 to 4 carbon atoms;

R_3 is hydrogen, a halogen, an alkyl group of 2 to 8 carbon atoms, or an alkenyl group of 2 to 8 carbon atoms;

R_4 and R_5 are each an alkyl group having 1 to 4 carbon atoms or R_4 and R_5 can form a carbocyclic ring having 3 to 6 carbon atoms; and

R_6 is hydrogen, an alkyl group having 1 to 8 carbon atoms, an alkenyl group having 2 to 5 carbon atoms or an alkynyl group having 3 to 8 carbon atoms;

and further wherein at least one of R_3 and R_6 is other than hydrogen;

and pharmaceutically acceptable salts thereof.

19. A method for treating inflammation or pain which comprises administering an effective amount of an anti-inflammatory, anti-pyretic and analgesic agent comprising a carrier and at least one quinolylacetic acid compound according to any one of claims **1** through **17**.

4,555,514

3-ALKOXY-2-(N-PYROLIDINO)-N-PYRIDYL-N-FURYL(OR THIENYL) METHYL-PYROPYL AMINES USEFUL AS CALCIUM ANTAGONISTS

Michel Combourieu, Aurillac; Jacques A. L. Simond, Les Martres De Veyre, and André J. Monteil, Chatel Guyon, all of France, assignors to Riom Laboratoires C.E.R.M. "RL-CERM" S.A., Riom, France

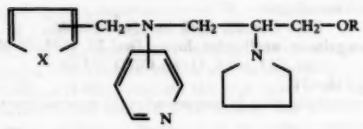
Filed Jan. 9, 1985, Ser. No. 690,051

Claims priority, application France, Jan. 18, 1984, 84 00755

Int. Cl.[4] C07D *487/12*

U.S. Cl. 514—343 **5 Claims**

1. A compound of the general formula:



in which X represents oxygen or sulphur and

R represents a linear or branched alkyl group with 1 to 7 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

5. A calcium antagonistic composition comprising a calcium antagonistic effective amount of a compound of claim **1** and a pharmaceutically acceptable excipient therefor.

4,555,515

PYRIDYLPROPYL CARBAMATES AS INSECT REPELLENTS

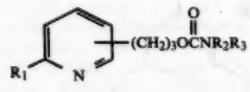
Rayman Y. Wong, Richmond, Calif., assignor to Stauffer Chemical Co., Westport, Conn.

Filed Feb. 25, 1985, Ser. No. 705,171

Int. Cl.[4] C07D *213/53*

U.S. Cl. 514—357 **2 Claims**

1. A method for repelling insects comprising applying to a locus to be protected from insects an amount of a compound having the formula



in which R_1 is hydrogen or C_1–C_4 alkyl and R_2 and R_3 are C_1–C_4 alkyl, effective to repel insects from said locus.

4,555,516

N-BENZYL-IMIDAZOLES AS SELECTIVE INHIBITORS OF THE THROMBOXANE SYNTHETASE ENZYME

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

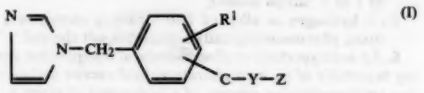
Filed Jan. 9, 1980, Ser. No. 110,711

Claims priority, application United Kingdom, Jan. 19, 1979, 7902114

Int. Cl.[4] A61K *31/415;* **C07D** *233/60*

U.S. Cl. 514—326 **11 Claims**

1. A compound of the formula

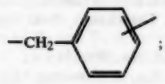


(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein:

R^1 is hydrogen, C_1–C_4 lower alkyl, C_1–C_4 lower alkoxy or halogen;

Y is $(CH_2)_n$ where n is an integer of from 1 to 4, or a group of the formula



; and

Z is $CONHR^3$, $CON(R^4)_2$ or CN wherein R^3 is hydrogen, C_1–C_4 lower alkyl or C_2–C_4 lower alkanoyl; and

each R^4 is C_1–C_4 lower alkyl or two groups R^4 together with the nitrogen atom to which they are attached form a pyrrolidino or piperidino group.

10. A pharmaceutical composition for use as a selective inhibitor of thromboxane synthetase enzyme comprising a thromboxane synthetase enzyme inhibiting amount of a compound of claim **1** together with a pharmaceutically acceptable diluent or carrier.

11. A method of selectively inhibiting the action of the thromboxane synthetase enzyme in an animal which comprises administering to the animal a thromboxane synthetase inhibiting amount of a compound of claim **1** or of a pharmaceutical composition of claim **10**.

4,555,517

PYRIDONE ESTERS AS INOTROPIC AGENTS

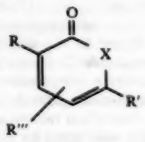
David M. Stout, Vernon Hills; Diane M. Yamamoto, Gurnee, both of Ill., and Cynthia Barcelon-Yang, Kenosha, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 3, 1984, Ser. No. 637,352

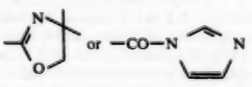
Int. Cl.[4] C07D *213/79, 413/04, 401/06;* **A61K** *31/455*

U.S. Cl. 514—336 **15 Claims**

1. A compound of the formula



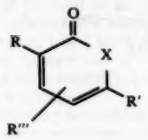
wherein R is hydrogen, lower alkyl, halo, cyano, hydroxy, amino, lower alkylamino, $—CH_2NH_2$, $—CH_2OH$ Or —COOR″; R′ is hydrogen, lower cycloalkyl or lower alkyl; R″ is $—CH_2Ar$ wherein Ar is phenyl, furan, thiophene or phenyl substituted with lower alkyl, halo, hydroxy, alkoxy or amino; R‴ is COOR″,



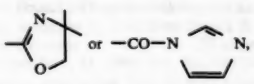
and X is nitrogen with the proviso that when R‴ is —COOR″, R cannot be hydrogen or cyano; or a pharmaceutically acceptable salt thereof.

7. A method of treating or relieving the symptoms associated

with impaired ventricular myocardia contractility in a patient by providing a positive inotropic effect comprising administering to a patient in need of such treatment a therapeutically effective amount of a compound of the formula



wherein R is hydrogen, lower alkyl, halo, cyano, hydroxy, amino, lower alkylamino, $-CH_2NH_2$, CH_2OH or COOR''; R' is hydrogen, lower cycloalkyl or lower alkyl; R'' is CH_2Ar wherein Ar is phenyl, furan, thiophene or phenyl substituted with lower alkyl, halo, hydroxy, alkoxy or amino; R''' is COOR'',



and X is nitrogen; or a pharmaceutically acceptable salt.

4,555,518

FLUOROALKOXY SUBSTITUTED BENZIMIDAZOLES USEFUL AS GASTRIC ACID SECRETION INHIBITORS

Georg Rainer, Konstanz, Fed. Rep. of Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Fed. Rep. of Germany

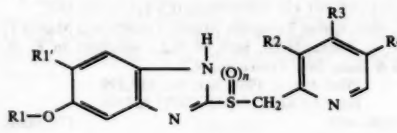
Filed May 1, 1984, Ser. No. 606,872

Claims priority, application Switzerland, May 3, 1983, 2401/83

Int. Cl.⁴ C07D *403/12;* **A61K** *31/44*

U.S. Cl. 514—338 **29 Claims**

1. A fluoroalkoxy compound of the formula



(I)

wherein

R1 represents a 1-3C-alkyl radical in the structure of which most or all hydrogen atoms are replaced by fluorine atoms, or a chlorodifluoromethyl radical,

R1' represents hydrogen, halogen, trifluoromethyl, a 1-3C-alkyl radical, or a 1-3C-alkoxy radical in the structure of which optionally most or all hydrogen atoms are replaced by fluorine atoms,

R2 represents hydrogen or a 1-3C-alkyl radical,

R3 represents hydrogen or a 1-3C-alkyl or 1-3C-alkoxy radical,

R4 represents hydrogen or a 1-3C-alkyl radical and

n represents the number 0 or 1,

or a salt thereof.

4,555,519

THROMBOXANE SYNTHETASE ENZYME INHIBITING N-[(1H-IMIDAZOL-1-YL) AND (1H-1,2,4-TRIAZOL-1-YL)ALKYL]PYRIDINECARBOXAMIDES

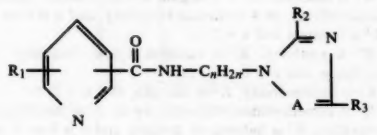
William B. Wright, Jr., Woodcliff Lake, and Jeffery B. Press, Rocky Hill, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 19, 1984, Ser. No. 673,069

Int. Cl.⁴ C07D *401/12;* **A61K** *31/455*

U.S. Cl. 514—340 **29 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen and halogen; R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl(C_1-C_3) and phenyl; A is selected from the group consisting of nitrogen and >CH; n is an integer from 2 to 8 inclusive; and the pharmaceutically acceptable salts thereof.

24. A method of inhibiting thromboxane synthetase enzyme in a mammal which comprises administering internally to said mammal a thromboxane synthetase enzyme inhibiting amount of a compound of the formula as recited in claim 1.

4,555,520

2-PYRIDYLCARBOXAMIDES WHICH INHIBIT ARACHIDONIC ACID RELEASE

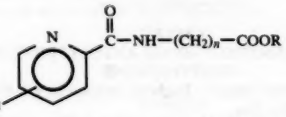
Raj N. Misra, Princeton, and Donald S. Karanewsky, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 20, 1984, Ser. No. 642,006

Int. Cl.⁴ C07D *213/81;* **A61K** *31/455*

U.S. Cl. 514—346 **21 Claims**

1. A compound having the structure



wherein n is 1 to 10,

R is hydrogen, lower alkyl, alkali metal or an amine salt; and

R^1 is C_6-C_{20} alkyl, C_6-C_{20} alkenyl, C_6-C_{20} alkoxy or phenyl, including pharmaceutically acceptable salts thereof.

18. A composition for inhibiting allergic conditions mediated by leukotrienes in a mammalian species, comprising an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier thereof.

4,555,521

NEMATICIDAL 3-SUBSTITUTED-4-PHENYL-1,2,5-THIADIAZOLES

John F. Engel, Washington Crossing, and Joseph M. Puglis, Newtown, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

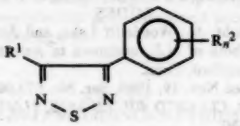
Filed Nov. 16, 1983, Ser. No. 552,595

Int. Cl.⁴ C07D *285/10;* **A01N** *43/82*

U.S. Cl. 514—362 **6 Claims**

1. A method for controlling nematodes which comprises

applying to the soil in which plants are or are to be planted a nematicidal amount of a compound of the formula



in which:

(a) R^1 is halogen, R^2 is halogen, cyano, methyl, methoxy, halomethoxy, or 4-methylcarbonyloxy, and n is 0 or 1; of R^2 is halogen and n is 2; or

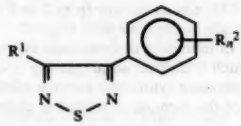
(b) R^1 is methoxy, R^2 is halogen, cyano, 4-methyl or 4-methoxy, and n is 0 or 1; or

(c) R^1 is halomethoxy, R^2 is halogen, and n is 1; or

(d) R^1 is dimethylaminocarbonyloxy or dimethylaminocarbonylthio, R^2 is halogen or methyl, and n is 0 or 1; or

(e) R^1 is cyano, methylthio, 2-propenyloxy, 2-propynyloxy, 2,2,2-trifluoroethoxy, or phenoxy, and n is 0.

5. A compound of the formula



in which

(a) R^1 is halogen, R^2 is halogen, cyano, or methoxy, halomethoxy, or 4-methylcarbonyloxy, and n is 1; or R^2 is halogen and n is 2; or

(b) R^1 is methoxy, R^2 is halogen, cyano, or 4-methoxy and n is 1; or

(c) R^1 is halomethoxy, R^2 is halogen, and n is 1; or

(d) R^1 is dimethylaminocarbonyloxy or dimethylaminocarbonylthio, R^2 is halogen or methyl, and n is 0 or 1; or

(e) R^1 is cyano, methylthio, 2-propenyloxy, 2-propynyloxy, 2,2,2-trifluoroethoxy, or phenoxy, and n is 0.

4,555,522

ANTITHROMBOTIC AND/OR ANTIHYPERTENSIVE COMPOSITIONS

Bernard K. Martin, Bagshot, England, assignor to T & R Chemicals, Inc., Clint, Tex.

Filed Jan. 3, 1984, Ser. No. 567,914

Claims priority, application United Kingdom, Jan. 5, 1983, 8300102

Int. Cl.[4] A61K *31/335, 31/35, 31/34, 31/266*

U.S. Cl. 514—449 **8 Claims**

1. A pharmaceutical composition in unit dosage form for use in treating a hypertensive or a thrombotic condition in a mammal, said composition comprising a pharmaceutically acceptable diluent or carrier and, as an active pharmaceutical agent, from 50 to 1,000 mg per unit dose of a sulphite or bisulphite ester having:

(A) the Formula IA:

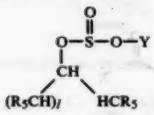
(Formula IA)

wherein

R_1 represents C_1–C_{10} alkyl, C_1–C_{10} hydroxyalkyl having a number of hydroxyl substituents from 1 to a value equal to the number of carbon atoms in the hydroxyalkyl group; and

R_2 represents C_1–C_{10} alkyl, or C_1–C_{10} hydroxyalkyl having a number of hydroxyl substituents from 1 to a value equal to the number of carbon atoms in the hydroxyalkyl group,

(B) the Formula ID:



(Formula ID)

wherein

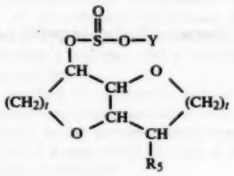
R_5 represents hydroxyl or

Y represents hydroxymethyl, methyl, ethyl or —$(CH_2)_l$—$N(CH_3)_3$;

l represents an integer from 1 to 4 inclusive;

t represents 1, 2 or 3, or

(C) the Formula IE:



(Formula IE)

wherein

R_5 represents hydroxyl or

Y represents hydroxymethyl, methyl, ethyl, or —$(CH_2)_l$—$N(CH_3)_3$; and

t represents 1, 2 or 3.

4,555,523

7-OXABICYCLOHEPTANE SUBSTITUTED THIO PROSTAGLANDIN ANALOGS AND THEIR USE IN THE TREATMENT OF THROMBOLYTIC DISEASE

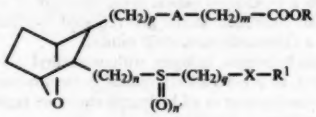
Steven E. Hall, Ewing Township, Mercer County, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 4, 1984, Ser. No. 617,199

Int. Cl.[4] A61K *31/34;* **C07D** *307/00*

U.S. Cl. 514—469 **17 Claims**

1. A compound having the structural formula



and including all steroisomers thereof, wherein A is —CH=CH— or —$(CH_2)_2$—; p is 0 to 4; m is 0 to 8; n is 1 to 4; n′ is 0, 1 or 2; q is 1 to 4; R is hydrogen, lower alkyl or alkali metal; X is S, O, or NH; and R^1 is lower alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons

and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, haloaryl, cycloalkyl or alkylcycloalkyl;

the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with lower alkyl, halogen or lower alkoxy;

the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups; and

$(CH_2)_p$, $(CH_2)_m$, $(CH_2)_n$ and $(CH_2)_q$ can be substituted by one or more alkyl groups.

10. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,555,524
TRANSDERMAL 2-(4-ISOBUTYLPHENYL)-PROPIONIC ACID MEDICATION AND METHODS

Klaus Gruber, Remagen; Manfred Löhner; Klaus Posselt, both of Bonn, and Hans H. Wagener, Meckenheim, all of Fed. Rep. of Germany, assignors to Dolorgiet GmbH & Co KG, Bonn, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 443,903

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205504

Int. Cl.⁴ A61K *31/19*

U.S. Cl. 514—570 **6 Claims**

1. A transdermal medicament for the delivery of 2-(4-isobutylphenyl)-propionic acid to a patient which comprises a sustained release vehicle containing a pharmaceutically effective amount of 2-(4-isobutylphenyl)-propionic acid, said sustained release vehicle comprising a base capable of substantially dissolving all of said 2-(4-isobutylphenyl)-propionic acid and containing from about 30 to about 50 parts by weight C_{6-12} carboxylic acid triglyceride, about 4 to about 10 parts by weight glycerol monostearate-polyoxyethylene stearate mixture and about 2 to about 10 parts by weight polyoxyethylene fatty acid ester.

4,555,525
USE OF DESETHYL-N-ACETYLPROCAINAMIDE (NAPADE) AS AN INOTROPIC AGENT

Juan J. L. Lertora, and Lucy W. King, both of New Orleans, La., assignors to Administrators of the Tulane Educational Fund, New Orleans, La.

Filed Aug. 31, 1984, Ser. No. 646,191

Int. Cl.⁴ A61K *31/16*

U.S. Cl. 514—616 **1 Claim**

1. A method of increasing the force of contraction of cardiac muscle in an animal requiring same comprising administering to said animal an inotropic effective amount of desethyl-N-acetylprocainamide or a pharmaceutically acceptable salt thereof.

4,555,526
METHOD FOR PRODUCING HYDROCARBONS

Tadahiro Wakui, Soka, and Tadahiko Handa, Hyogo, both of Japan, assignors to Daido Sanso K. K., Osaka, Japan

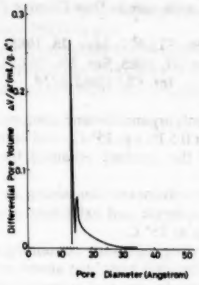
Filed Jul. 13, 1984, Ser. No. 630,560

Claims priority, application Japan, Jul. 15, 1983, 58-130119

Int. Cl.⁴ C07C *1/04*

U.S. Cl. 518—717 **7 Claims**

7. A method for selectively producing hydrocarbons useful in the manufacture of gasoline, kerosene and light oil, which comprises contacting synthesis gas having a molar ratio of hydrogen to a combined amount of at least one of carbon monoxide and carbon dioxide of from 0.5 to 3.0 with a heterogeneous catalyst at a temperature of from 200° to 350° C. and at a pressure of from 0 to 100 Kg/cm^2A and at a gas space velocity of from 500 to 5000 l/hour, said heterogeneous catalyst comprising 0.1 to 50 parts by weight of at least one VIII group metal capable of reducing at least one of carbon monoxide and carbon dioxide supported on 100 parts by weight of a



metal oxide carrier having a very narrow pore size distribution in the micropores region within the range of between substantially 10 to 100 Angstroms.

4,555,527
PROCESS FOR THE PREPARATION OF ACRYLAMIDE GRAFT POLYMER DISPERSIONS

Duane A. Heyman, Monroe, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 510,565, Jul. 5, 1983, Pat. No. 4,503,207. This application Dec. 14, 1984, Ser. No. 681,838

Int. Cl.⁴ C08G *18/14*

U.S. Cl. 521—67 **6 Claims**

1. A polyurethane foam prepared by reacting (a) a white stable low viscosity graft polymer dispersion prepared by polymerizing, in the presence of an effective amount of a free radical initiator, in an unsaturation containing polyol or polyol mixture, an aqueous solution of acrylamide and removing the water during or after said polymerization (b) an organic polyisocyanate, and (c) a blowing agent in the presence of an effective amount of a urethane forming catalyst.

4,555,528
PROCESS FOR MAKING FOAMED, SULFUR-CURED POLYMER BLEND COMPOSITIONS

Gary L. Loomis, Drexel Hill, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 692,634, Jan. 18, 1985. This application Apr. 2, 1985, Ser. No. 719,054

Int. Cl.⁴ C08J *9/06*

U.S. Cl. 521—89 **11 Claims**

1. A foamable and curable composition comprising a polymer blend of

(1) 5 to 95 parts of an E/X/Y copolymer, wherein

E is ethylene;

X is a vinyl ester; and

Y is carbon monoxide or sulfur dioxide; and

(2) 95 to 5 parts of a polymer of a vinyl halide or vinylidene halide, the total amount of polymers (1) plus (2) being 100 parts;

(3) an effective amount of a blowing agent; and

(4) at least one curing agent selected from

(a) about 0.2 to 5 parts of sulfur and

(b) about 0.2 to 15 parts of an agent capable of releasing elemental sulfur under the cure conditions, at a temperature of about 100°–180° C.

4,555,529
FOAMABLE POLYORGANOSILOXANE COMPOSITIONS

Chi-Long Lee; Myron T. Maxson, and James A. Rabe, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 715,807, Mar. 25, 1985. This application Jun. 21, 1985, Ser. No. 747,217
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—124 **15 Claims**

1. A foamable polyorganosiloxane composition exhibiting a viscosity of at least 0.5 Pa.s at 25° C., said composition consisting essentially of the product obtained by homogeneously blending together

(A) a polydimethylsiloxane containing at least two vinyl radicals per molecule and exhibiting a viscosity of from 0.1 to 100 Pa.s at 25° C.;

(B) an organohydrogensiloxane containing an average of at least 3 silicon-bonded hydrogen atoms per molecule in an amount sufficient to cure said composition in the presence of a hydrosilation catalyst;

(C) a catalytically effective amount of a platinum-containing hydrosilation catalyst,

(D) from 0.2 to 25%, based on the weight of said polyorganosiloxane composition, of a foam stabilizer consisting essentially of a resinous, benzene-soluble organosiloxane copolymer comprising $SiO_{4/2}$ units, $(CH_3)_3SiO_{1/2}$ units and fluorine-containing units selected from the group consisting of $R_aR_b'SiO_{(4-a-b)/2}$, $R''[Si(R')_bO_{(3-b)/2}]_2$ and combinations thereof, where R is a monovalent organic radical containing at least four Perfluorinated carbon atoms, R′ is an alkyl radical containing from 1 to 3 carbon atoms, R″ is a divalent organic radical containing at least four perfluorinated carbon atoms, R and R″ are bonded to the silicon atoms of their respective fluorine-containing units by means of a sequence of at least two methylene radicals or a silicon-bonded oxygen atom that is, in turn, bonded to a sequence of at least two methylene radicals, a is 1 or 2, b is 0, 1 or 2 and the sum of a and b is 3 or less, the molar ratio of all units other than hydroxyl and said $SiO_{4/2}$ units to said $SiO_{4/2}$ is from 0.7:1 to 1.1:1 inclusive, and the molar ratio of the $(CH_3)_3SiO_{1/2}$ units with respect to said fluorine-containing units and any remaining units other than said $SiO_{4/2}$ units is such that

(a) the surface tension exhibited by a 10% by weight solution of (D) in a trimethylsiloxy endblocked polydimethylsiloxane exhibiting a viscosity of 0.01 Pa.s at 25° C. is less than 2.2×10^{-4} newtons per cm at 25° C., and

(b) said 10% by weight solution requires the addition of from 0 to 5 weight % of xylene to achieve clarity at 25° C. and;

(E) an amount of a blowing agent sufficient to convert said composition to a foam during exposure of said composition to atmospheric pressure and a temperature of at least 0° C.

4,555,530
HALOGENATED PHENOLIC POLYOLS AND RIGID CELLULAR COMPOSITIONS MADE THEREFROM

John T. Patton, Jr., Wyandotte, Mich., and John P. Rupert, Wadsworth, Ohio, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 458,286, Jan. 17, 1983, Pat. No. 4,448,952. This application May 7, 1984, Ser. No. 581,429
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—131 **5 Claims**

1. A rigid cellular composition obtained by reacting, in the presence of a polymerization catalyst and a blowing agent, (1) an organic polyisocyanate with (2) a modified high ortho-benzyllic ether-containing resole polyol (2), said polyol obtained by a process comprising reacting, at a temperature of 100° C. to 130° C., a mixture of

(a) a phenolic component comprising phenol or a mixture of phenol and a phenol which is substituted in the meta or para position with halogen, C_1–C_{12} alkyl, or halogen-substituted alkyl of 1 to 6 carbon atoms;

(b) a molar excess relative to the phenolic component of a non-aqueous aldehyde having the formula RCHO where R is hydrogen, alkyl of 1 to 5 carbon atoms, or halogenated alkyl of 1 to 5 carbon atoms;

(c) less than 50 mole percent relative to the phenolic component of a hydroxylic component having one or more aliphatic hydroxyl compounds which contain 1 to 4 hydroxyl groups, 1 to 12 carbon atoms, and 0 to 5 ether oxygen atoms wherein the hydroxylic component contains at least 15 mole percent of a halogenated alcohol having 2 to 4 carbon atoms and at least 60 weight percent of halogen having an atomic number of 17 to 35; and

(d) an effective amount of a metal salt catalyst.

4,555,531
RIGID POLYURETHANE FOAMS EMPLOYING ALKYLENE OXIDE ADDUCTS OF ALKANOLAMINES

Donald L. Christman, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 14, 1985, Ser. No. 691,479
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—167 **10 Claims**

1. A rigid polyurethane foam comprising the reaction product of

(a) a polyoxyalkylene polyether polyol other than one derived from an alkanolamine,

(b) an ethylene oxide-propylene oxide adduct of an alkanolamine having a molecular weight range from about 200 to about 500 and containing an amount of ethylene oxide from about 20 weight percent to about 96 weight percent,

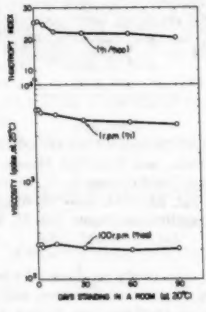
(c) catalyst, surfactant, blowing agent, and

(d) an organic polyisocyanate.

4,555,532
EPOXY RESIN COMPOSITION

Isamu Tanaka, Yokosuka; Hiroshi Kikuchi, Zushi; Akira Tomizawa, and Hitoshi Oka, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

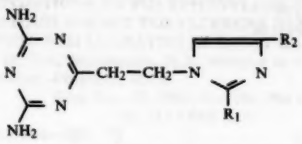
Filed Oct. 10, 1984, Ser. No. 659,565
Claims priority, application Japan, Oct. 14, 1983, 58-190756; Jul. 13, 1984, 59-144240
Int. Cl.[4] C08L *63/00*; C09D *3/58*
U.S. Cl. 523—400 **26 Claims**



1. An epoxy resin composition comprising

(a) 100 parts by weight of an epoxide compound having more than one epoxy group on the average per molecule,

(b) 1 to 20 parts by weight of a diaminotriazine-modified imidazole compound represented by the formula:



(I)

wherein R_1 is an alkyl group having 1 to 20 carbon atoms or a phenyl group; and R_2 is a hydrogen atom or a lower alkyl group, or an acid adduct thereof,

(c) dicyandiamide in an amount of 0.2 to 2.0 equivalent weight per epoxy equivalent weight of the epoxide compound (a),

(d) 3 to 40 parts by weight of a filler,

(e) 0.5 to 10 parts by weight of an anti-foaming agent, and

(f) a thixotropic agent in an amount of making a thixotropy index of the whole composition 5 to 40 and a viscosity of the whole composition 800 to 10,000 poises when measured by using a B type rotational viscometer at a rotational rate of 1 r.p.m. at 20° C.,

whereby said composition has a storage stability of at least 30 days and cures at temperatures as low as 130° C., and has good screen printing properties, and provides a cured product that has excellent resistance to electroless plating baths and to soldering heat.

4,555,533

BONDING ASSISTANT FOR A SUPPORT MATERIAL

Peter Ambros, Hohenroth, and Erich Gatzke, Bad Neustadt, both of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,209

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028496

Int. Cl.⁴ C08L *3/00;* **C08K** *3/34, 3/18;* **H05K** *3/38*

U.S. Cl. 523—440 **3 Claims**

1. A bonding assistant for use in a printed circuit, which consists essentially of a composition containing:

(a) from 50 to 80 percent by weight of a mixture of a saturated polyester and an isophorone diisocyanate containing masked isocyanate groups;

(b) from 5 to 40 percent by weight of a mixture of epoxy resin ester and/or acrylic resin and/or melamine formaldehyde resin and/or an alkyd resin; and

(c) from 10 to 50 percent by weight of filler particles of a particle size less than 15 μm dispersed therein; in which the composition is curable at a temperature of from 180° to 250° C.

4,555,534

UNIFORMLY PIGMENTED, LOW SHRINKING POLYESTER MOLDING COMPOSITIONS

Kenneth E. Atkins, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 247,991, Mar. 26, 1981, abandoned, which is a continuation of Ser. No. 868,447, Jan. 10, 1978, abandoned, which is a continuation of Ser. No. 737,580, Nov. 1, 1976, abandoned. This application Sep. 23, 1982, Ser. No. 422,078

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.⁴ C08K *3/22, 5/06, 5/10, 5/13*

U.S. Cl. 523—507 **22 Claims**

1. A curable molding composition containing:

(a) a polyester resin that is suitable for use in molding and which comprises the reaction product of an olefinically unsaturated dicarboxylic acid or anhydride and a polyol;

(b) an olefinically unsaturated monomer that is copolymerizable with said polyester resin;

(c) a thickening agent comprising an oxide or hydroxide of a metal or Group I, II, or III of the Periodic Table;

(d) a pigment;

(e) a carboxylated vinyl acetate polymer low profile additive having a molecular weight within the range of from about 10,000 to about 250,000; and

(f) a surface active compound that is employed in an amount sufficient to enhance the uniformity of the pigmentation of the cured composite produced from said curable molding composition.

4,555,535

ACRYLIC POLYURETHANE COATING COMPOSITION

Milan B. Bednarek, Carabobo Valencia, Venezuela, assignors to E.I. Du Pont de Nemours and Company, Wilmington, Del.

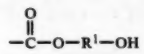
Filed Mar. 7, 1984, Ser. No. 587,062

Int. Cl.⁴ C08L *1/14*

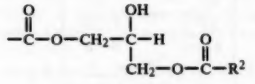
U.S. Cl. 524—40 **23 Claims**

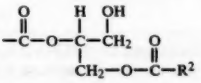
1. A coating composition having a binder solids content of 5–75% by weight and 95–25% by weight in an organic liquid; wherein the binder consists essentially of about

(1) 50–95% by weight of an acrylic polymer having a backbone consisting essentially of polymerized monomers selected from the group consisting of alkyl methacrylate, alkyl acrylate each having 1–12 carbon atoms in the alkyl group, styrene or mixtures thereof and polymerized ethylenically unsaturated ester monomers that form ester groups pending from the carbon atoms of the polymer backbone and consist of about 10 to 75% of the total weight of the polymer and consist of ester group (A)

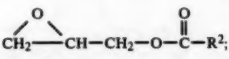


and ester group (B) selected from the group consisting of





or mixtures thereof; wherein ester group B is formed by reacting carboxyl groups pending from the backbone of the acrylic polymer with glycidyl esters of the formula



R^1 is a saturated hydrocarbon group having 2–4 carbon atoms,

R^2 is a tertiary hydrocarbon group having 8 through 10 carbon atoms; and

(2) 5–50% by weight of an aliphatic, aromatic or cycloaliphatic polyisocyanate.

4,555,536

ANTI-CORROSIVE COATING COMPOSITION

Hirohisa Maki, Neyagawa; Takashi Sano, Kyoto, and Misao Yamamoto, Otsu, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jul. 3, 1984, Ser. No. 627,580

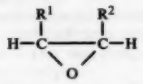
Claims priority, application Japan, Jul. 4, 1983, 58-121916; Jul. 6, 1983, 58-123633

Int. Cl.[4] C08G *18/50, 18/36*

U.S. Cl. 524—66 **4 Claims**

1. An anti-corrosive coating composition consisting essentially of a non-foamed reaction product of:

(1) a mixture of (a) a castor oil polyol and (b) an amine polyol produced by addition reaction of an alkylene oxide of the formula:



wherein R^1 and R^2 are hydrogen, alkyl or aryl, provided that at least one of R^1 and R^2 is hydrogen,

to a nitrogen-containing compound having at least 2 active hydrogen atoms, said amine polyol having at least 2 hydroxyl groups and a hydroxyl value of at least 150 mgKOH/g, the amount of said amine polyol being 5 to 70% by equivalent based on the total polyol; and

(2) a polyisocyanate compound, the amount of said polyisocyanate compound being such that the ratio of isocyanato group to the active hydrogen of the polyol is from 0.85 to 1.15:1 by equivalent.

4,555,537

HETERO NITROGEN CONTAINING COMPOUNDS AND POLYMERMS LIGHT STABILIZED WITH SAID COMPOUNDS

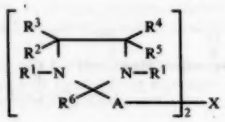
Richard Spector, Kendall Park, and Donald R. Maulding, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 8, 1983, Ser. No. 520,933

Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—97 **21 Claims**

1. A compound of the formula:



wherein;

(1) R^1 represents hydrogen, alkyl (C_1–C_6) hydroxyl, or oxyl;

(2) R^2 and R^3, which may be the same or different, represent alkyl (C_1–C_6), cycloalkyl (C_5–C_6), or together with the carbon to which they are attached form a cycloalkyl (C_5–C_6) radical;

(3) R^4 and R^5, which may be the same or different, represent the same groups as R^2 and R^3;

(4) R^6 represents:

(a) alkyl (C_1–C_{18}); or

(b) substituted alkyl (C_1–C_8); or

(c) together with the carbon to which they are attached form a cycloalkyl (C_5–C_6) radical; or

(d) optionally, (C) is substituted with alkyl (C_1–C_8); or

(e) substituted cycloalkyl (C_5–C_6) radical; or

(f) a substituted alkyl (C_1–C_8) - substituted cycloalkyl (C_5–C_6) radical;

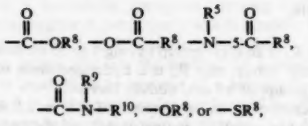
wherein said substitutents of (b), (e) and (f) are selected from:

(i) amino; or

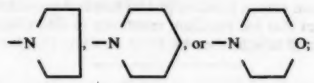
(ii) cyano; or

(iii) hydroxy; or

(iv)



wherein R^8 is selected from alkyl (C_1–C_{18}) and cycloalkyl (C_5–C_6), R^9 is hydrogen, alkyl (C_1–C_{18}), or cycloalkyl (C_5–C_6), R^{10} is alkyl (C_1–C_{18}) or cycloalkyl (C_5–C_6), or R^9 and R^{10}, together with the nitrogen atom to which they are attached, form a ring represented by the formula:



or

(v)

wherein R^9 and R^{10} are as defined in (iv);

(5) the group

represents:

(a) alkylene (C_2–C_6); or

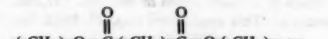
(b) arylene (C_6–C_{10}); or

(c) arylenedialkyl (C_8–C_{12}); or

(d) a substituted alkylene (C_1–C_8); or

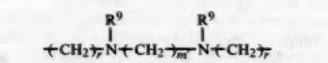
(e) A together with R^6 and the carbon atom to which they are attached form a substituted cycloalkyl ring (C_5–C_6);

wherein the substituents of (d) and (e) are:



(i)

(ii)



(iii)

wherein m is zero to 6, m' is 2 to 6, and r is zero to 2.

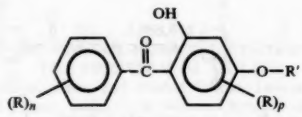
4,555,538

COMPOSITIONS OF POLYPHENYLENE ETHER RESIN AND HIGH IMPACT POLYSTYRENE RESIN HAVING IMPROVED ULTRAVIOLET LIGHT RESISTANCE

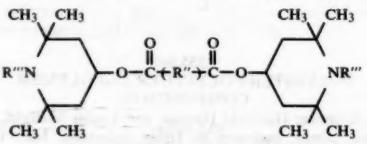
Peter H. Shu, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 22, 1983, Ser. No. 564,420
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—102 26 Claims

1. A thermoplastic composition, comprising an admixture of
(a) a polyphenylene ether resin; and
(b) an effective amount of an ultraviolet light stabilizing combination of
(1) one or a mixture of two or more compounds having the formula



in which R′ is hydrogen, alkyl having from 1 to 25 carbon atoms or aryl; each R is, independently, hydrogen, hydroxy, alkoxy having from 1 to about 10 carbon atoms, alkyl having from 1 to about 10 carbons atoms, or aryl; and n and p are independently zero or an integer from 1 to the total number of replaceable hydrogen atoms; and
(2) one or a mixture of two or more compounds having the formula



in which R″ is alkyl, straight or branched, or aryl unsubstituted or substituted, in which (b)(1) is present in an amount from about 0.5 to about 10 parts by weight, and (b)(2) is present in an amount from about 0.05 to about 1 part by weight, per 100 parts of (a) and (b) together.

4,555,539

FIREPROOF POLYMER MATERIAL

Jean-Pierre Bonicel, Lyons; Madeleine Prigent, Marcoussis, and Christian Cottevieille, Montreuil, all of France, assignors to Les Cables de Lyon, S.A., Clichy Cedex, France

Filed Mar. 17, 1982, Ser. No. 359,077
Claims priority, application France, Mar. 19, 1981, 81 05491
Int. Cl.[4] C08K 5/52
U.S. Cl. 524—127 2 Claims

1. A fireproof polymer material, which comprises:
(a) a polymer material containing polyethelene and a copolymer of ethylene and of alkyl acrylate;
(b) 25% to 35% by weight relative to the weight of the polymer matrix of a brominated diphenyloxide;
(c) 8% to 17% by weight relative to the polymer matrix of antimony oxide; and
(d) 0.1% to 0.5% by weight relative to the weight of polymer matrix of an organic titanate selected from the group consisting of isopropyl-tri(dioctylpyrophosphato)titanate, isopropyl-tri(dioctylphosphato)titanate, di(dioctylpyrophosphato)ethylene-titanate, di(dioctylphosphato)ethylene-titanate, titanium di(dioctylpyrophosphato)oxyacetate, and tri(butyl-octyl, pyrophosphato)ethylene-titanate, wherein the polymer material is a non reticulated mixture of 40% to 50% by weight of polyethylene and 50% to 60% of copolymer of ethylene and of alkyl acrylate.

4,555,540

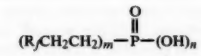
STABILIZATION OF FLAME RETARDANT POLYCARBONATE-POLYESTER COMPOSITIONS

Roger W. Avakian, Brasschaat, Belgium, assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1984, Ser. No. 687,576
Int. Cl.[4] C08K 5/52, 5/53
U.S. Cl. 524—130 34 Claims

1. A thermoplastic composition, comprising
(a) an aromatic polycarbonate, an aromatic poly(ester-carbonate), an aromatic dihydric phenol sulfone carbonate, or a mixture of any of the foregoing, in combination with
(b) a polyester resin comprising units of an aliphatic diol, an aliphatic ether diol, a cycloaliphatic diol, or a mixture of such diols and an aromatic or cycloaliphatic diacid;
(c) a flame retardant amount of a halogen-containing flame retardant agent;
(d) a metal oxide synergist for (c) in an amount which enhances the flame retardancy of the composition; and
(e) a phosphorus-containing compound of the formula

where Y is hydrogen or phenyl, or of the formula



where R_f is $F(CF_2\ CF_2)_t$, n and m are independently 1 or 2, and t is an integer from 3 to 8, said component (e) being present in an amount which substantially deactivates the transesterification causing properties of (d) and prevents said transesterification from occuring when the composition is processed at elevated temperatures.

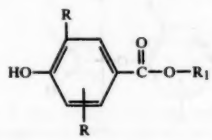
4,555,541

BENZOATE-STABILIZED RIGID POLYVINYL CHLORIDE COMPOSITIONS

William J. Reid, New Fairfield, Conn.; Jean M. Zappia, Yonkers, N.Y.; Gerald A. Capocci, Greenwich, Conn., and John D. Spivack, Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

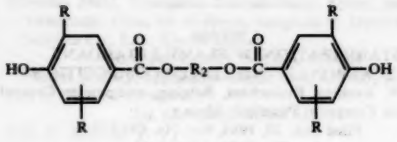
Filed Feb. 13, 1984, Ser. No. 579,232
Int. Cl.[4] C08K 5/58
U.S. Cl. 524—180 29 Claims

1. A rigid polyvinyl chloride composition comprising in addition to said polyvinyl chloride, 2 to 8% titanium dioxide, by weight of the polyvinyl chloride, an effective thermal stabilizing amount of a tin mercaptide and an effective stabilizing amount of a benzoate compound of the formulae

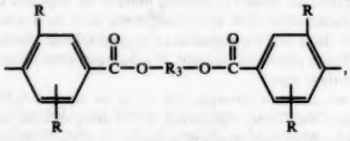


(I)

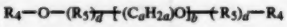
wherein
R is alkyl and
R_1 is alkyl, haloalkyl, phenyl, alkyl-substituted phenyl, alkyl-substituted benzoyloxy;



wherein
R is as defined hereinabove,
R_2 is alkylene, haloalkylene or

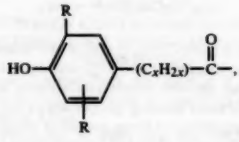


and R_3 is alkylene or haloalkylene;

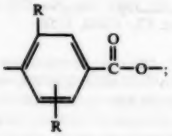


(III)

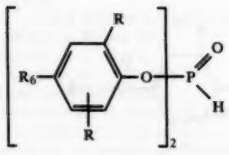
wherein
R_4 is



a is an integer from 2 to 6,
b is an integer from 3 to 40,
x is an integer from 0 to 6,
d is 0 or 1,
R is as defined hereinabove, and
R_5 is

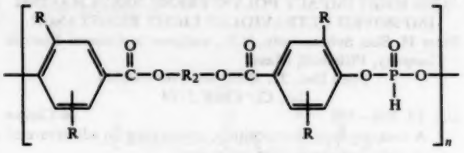


(IV)



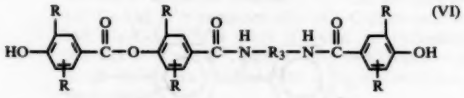
wherein
R is as previously defined,
R_6 is —$COOR_7$, and
R_7 is alkyl, phenyl or alkyl-substituted phenyl;

(II)



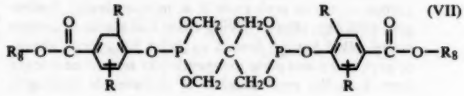
(V)

wherein
R and R_2 are as previously defined, and
n is 1–15;



(VI)

wherein R and R_3 are as previously defined; and



(VII)

wherein
R is as previously defined, and
R_8 is alkyl, phenyl or alkyl-substituted phenyl.

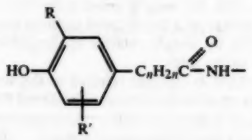
4,555,542

POLYESTER-POLYETHER COPOLYMER COMPOSITION

Hideo Komatsu; Hiroyuki Harada, and Tomiji Matsuki, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 347,624, Feb. 10, 1982, abandoned. This application Dec. 21, 1983, Ser. No. 564,342
Claims priority, application Japan, Feb. 10, 1981, 56-17526
Int. Cl.[4] C08K *5/57*
U.S. Cl. 524—178 **10 Claims**

1. A stabilized polyester-polyether copolymer composition having improved thermal life and color change properties when exposed to air hotter than 120° C. which comprises a polyester-polyether copolymer composed mainly of an aromatic dicarboxylic acid, 1,4-butane diol and a polyalkylene ether glycol of average molecular weight from about 400 to about 6,000, about 0.002% to 0.1% by weight of a monalkyl tin compound based on the amount of tin in the monalkyl tin compound, and about 0.1% to about 0.5% by weight of an amide-containing phenolic antioxidant based on the weight of the polyester-polyether copolymer composition, the antioxidant having at least one hindered phenol group and at least one amide group represented by the following formula:



where R is a secondary or tertiary alkyl group, R′ is a hydrogen atom or a secondary or tertiary alkyl group, and n is from 0 to 6.

4,555,543

FLUOROPOLYMER COATING AND CASTING COMPOSITIONS AND FILMS DERIVED THEREFROM

John A. Effenberger, Bennington, Vt., and Frank M. Keese, Hoosick Falls, N.Y., assignors to Chemical Fabrics Corporation, Merrimack, N.H.

Filed Apr. 13, 1984, Ser. No. 599,764
Int. Cl.[4] C08L 27/00, 27/14
U.S. Cl. 524—520 7 Claims

1. A fluid composition which comprises a blend of a perfluoroelastomer and a perfluoroplastic, wherein the perfluoroplastic component comprises up to about 95% by weight of the composition.

4,555,544

HARDENING PHENOL-FORMALDEHYDE RESOLS IN THE PRESENCE OF ANILINE

Nicolas Meyer, Lens, and Michel Cousin, Loison sous Lens, both of France, assignors to Societe Chimique des Charbonnages CDF Chimie, S.A., Paris, France

Filed Dec. 28, 1984, Ser. No. 687,230
Claims priority, application France, Dec. 30, 1983, 83 21058
Int. Cl.[4] C08G 8/32, 8/28, 14/06
U.S. Cl. 524—595 13 Claims

1. In a process for hardening phenol-formaldehyde resol resins, comprising conducting the hardening of the resins with an acidic solution of water and/or an organic solvent having dissolved therein an aromatic sulphonic acid and/or concentrated sulphuric acid, the improvement comprising conducting the hardening in the presence of aniline added to the phenolic resin beforehand in a quantity of between about 0.5 and 2% relative to the weight of the phenolic resin.

4,555,545

COMPOSITION FOR COATING

Hiroshi Kimura; Ikurou Mori, and Bunjirou Murai, all of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1985, Ser. No. 697,358
Claims priority, application Japan, Feb. 9, 1984, 59-20893
Int. Cl.[4] C08L 83/00
U.S. Cl. 524—858 4 Claims

1. A composition for coating, which comprises:

(1) 100 parts by weight of film forming components comprising:

(A) 10 to 90% by weight of an organosilane triol of the following formula and/or its partial condensate:

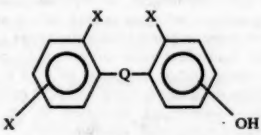
$R^1Si(OH)_3$

wherein R^1 represents a monovalent group selected from the group consisting of alkyl groups having 1 to 3 carbon atoms and aryl groups, and

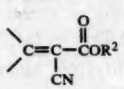
(B) 90 to 10% by weight of colloidal silica; and

(2) 5 to 40 parts by weight of a copolymer of:

(C) a compound represented by the formula:



wherein Q represents >C=O or the following formula:



wherein each X may be either the same or different and each represents hydrogen atom or hydroxyl group, of which at least one is hydroxyl group, and R^2 represents an alkyl group having 1 to 18 carbon atoms, and

(D) an epoxy group-containing trialkoxysilane.

4,555,546

COMPATIBILIZED BLENDS OF ACRYLIC ESTER

Raman Patel, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 566,641, Dec. 29, 1983, abandoned. This application Nov. 27, 1984, Ser. No. 674,240
Int. Cl.[4] C08L 23/04, 23/26, 33/08, 51/06
U.S. Cl. 525—194 37 Claims

1. A compatibilized polymer composition comprising a blend of about 1–99 parts by weight of an olefin polymer comprising amorphous or crystalline essentially saturated homopolymers or copolymers of C_2–C_8 alpha monoolefins, about 99–1 parts by weight of cured acidic acrylic ester copolymer rubber containing about 0.1–25 mole percent of carboxylic acid; and at least about 0.1 weight percent of a graft copolymer comprising at least one olefin polymer compatibilizing segment derived from an olefin polymer selected from the group consisting of amorphous or crystalline essentially saturated homopolymers or copolymers of C_2–C_8 alpha monoolefins, polybutadiene, polyisoprene, and polyalkenamer and at least one acidic acrylic ester copolymer rubber compatibilizing segment derived from a polymer selected from the group consisting of epichlorohydrin polymer, nitrile rubber, urethane polymer, vinyl chloride polymer, polyamide, polyamine, acrylic polymer, polyester, and acidic acrylic ester copolymer rubber.

4,555,547

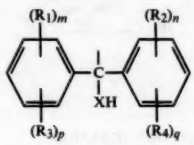
RUBBER COMPOSITION FOR TIRE TREADS

Akio Ueda, Yokohama; Shuichi Akita, and Toshio Namizuka, both of Kamakura, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,421
Int. Cl.[4] C08L 7/00, 9/00, 9/06
U.S. Cl. 525—237 8 Claims

1. A rubber composition for tire treads, said composition comprising

(I) 10 to 70% by weight of an essentially amorphous polybutadiene rubber having a 1,2-linkage content of 40 to 90% and having bonded to a carbon atom of the rubber molecular chain at least 0.1 mole and up to about 5 moles, per mole of the rubber molecular chain, of an atomic grouping represented by the general formula



wherein X represents 0 or S, R_1 and R_2 are identical or different and each represents an amino group or an alkyl-substituted amino group, R_3 and R_4 are identical or different and each represents a substituent other than an amino group or an alkyl substituted amino group, m, p and q represent 0 or an integer of at least 1, n represents an integer of at least 1, m+p=0–5 and n+q=1–5, and

(II) 90 to 30% by weight of at least one rubber selected from the group consisting of styrene/butadiene copolymer rubber having a bound styrene content of from 3 to not more than 50% by weight and a 1,2-linkage content of butadiene units of 10 to 90%, natural rubber and synthetic polyisoprene rubber having a cis-1,4-linkage content of at least 90%.

4,555,548

RUBBER COMPOSITION FOR TIRE TREADS

Akio Ueda, Yokohama; Shuichi Akita, and Takeshi Chida, both of Kamakura, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

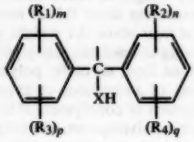
Filed Aug. 23, 1984, Ser. No. 643,420

Int. Cl.[4] C08L *7/00, 9/00, 9/06*

U.S. Cl. 525—237 **7 Claims**

1. A rubber composition for tire treads, said composition comprising

(I) 10 to 90% by weight of a styrene-butadiene copolymer rubber containing not more than 40% by weigtht of bound styrene and having bonded to a carbon atom of the rubber molecular chain at least 0.1 mole and up to 5 moles, per mole of the rubber molecular chain, of an atomic grouping represented by the following formula



wherein:

X represents O or S,

R_1 and R_2 are identical or different and each represents an amino group or an alkyl-substituted amino group,

R_3 and R_4 are identical or different and each represents a substituent other than an amino group or alkyl-substituted amino group,

m, p and q represent O or an integer of at least 1,

n represents an integer of at least 1, m+p=0−5 and n+q=1−5, and

(II) 90 to 10% by weight of at least one rubber selected from the group consisting of styrene-butadiene copolymer rubber having a bonded styrene content of not more than 40% by weight, natural rubber and synthetic polyisoprene rubber having a cis 1,4-linkage content of at least 90%.

4,555,549

POLYOXYALKYLENE POLYMERS AS LUBRICANTS PARTICULARLY IN MOLDING PROCESSES

Ronald L. Camp, Riverview; Edward M. Dexheimer, Grosse Ile, and Michael J. Anchor, Canton Township, Wayne County, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 26, 1984, Ser. No. 675,018

Int. Cl.[4] C08L *71/02*

U.S. Cl. 525—409 **4 Claims**

1. A composition of matter comprising: a polyoxyethylene-polyoxypropylene copolymer which is a cogeneric mixture of compounds represented by the formula:

$$HO(C_2H_4O)_m(C_3H_6O)_n(C_2H_4O)_mH$$

wherein n is an integer; the value of which is such that the molecular weight of the oxypropylene groups is from about 2500 to 4000; and the value of m is such that the oxyethylene groups constitute about 20 to 80 percent by weight of the compound and

a copolymer which is a cogeneric mixture of compounds represented by the formula:

$$R—O(A)H$$

wherein R is an essentially linear alkyl group having from 10 to 18 carbon atoms, with the proviso that at least 70 weight percent of said compounds in said mixture have an R of from 12 to 16 carbon atoms and A is a random mixture represented by the latter formula of oxypropylene and oxyethylene groups, said oxypropylene and oxyethylene groups being from 55 percent to 80 percent of the total weight of the compounds, the oxypropylene to oxyethylene ratio being from about 0.85:1 to 2.75:1.

4,555,550

MOLDING COMPOSITIONS BASED ON HIGH MOLECULAR WEIGHT POLYETHER ESTER AMIDES

Michael Droescher; Salih Mumcu; Klaus Burzin; Christian Gerth, and Horst Heuer, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 705,168

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406951

Int. Cl.[4] C08L *77/00*

U.S. Cl. 525—424 **10 Claims**

1. A molding composition based on a high-molecular weight polyether ester amide having a relative solution viscosity η_{rel} of at least 2.0, prepared by heating at 180°–250° C. a molten mixture of

(A.) a polyether ester amide with a relative solution viscosity η_{rel} of at least 1.5 and less than 2.0; and

(B.) 0.05–1.5 parts by weight, based on 100 parts by weight of the molding composition, of a cyclic, trimerized isophorone diisocyanate or an oligomer thereof having a degree of oligomerization of 2–5 and an isocyanate functionality of 3–7;

for a time effective to increase the η_{rel} value of (A.) to at least 2.0.

4,555,551

METHOD OF MOLDING

Joseph M. Makhlouf, Mars; Gregory J. McCollum, Glenshaw, and Paul R. Kerr, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 427,397, Sep. 29, 1982, Pat. No. 4,477,405, which is a division of Ser. No. 336,226, Dec. 31, 1981, Pat. No. 4,425,468. This application Jun. 1, 1984, Ser. No. 616,035

Int. Cl.[4] C08G *18/12, 18/32*

U.S. Cl. 525—455 **10 Claims**

1. A method of providing a molded thermoset article which comprises:

(a) depositing in a mold a charge of a thermosetting-molding composition, comprising a dispersion of the following ingredients in an ethylenically unsaturated monomer:

(i) a polymerizable ethylenically unsaturated ureaurethane polymer prepared by a process, which comprises

A. reacting a polyisocyanate, at least a portion of which is a diisocyanate, with a polyfunctional amine containing primary and/or secondary amino groups in the presence of a polyol, at least a portion of which is a polymeric polyol, free of ethylenic unsaturation and a diluent which is an ethylenically unsaturated compound free of active hydrogens, the equivalent ratio of isocyanate to active hydrogen in said polyol and said polyfunctional amine being within the range of 1.1 to 2.0/1 and the equivalent ratio of polyol to polyfunctional amine being within the range of 0.75 to 20/1, under conditions sufficient to form an NCO group-containing polyurea-polyurethane dispersed in an ethylenically unsaturated compound; followed by

B. reacting the NCO group-containing polyurea-polyurethane dispersion with an active hydrogen containing polymerizable ethylenically unsaturated compound

under conditions sufficient to react the NCO-functionality with the active hydrogens thereby forming the polymerizable ethylenically unsaturated urea-urethane polymer dispersion;

(ii) a mold release agent;

(b) heating the charge while in the mold so as to cure it and form a thermoset article; and

(c) removing the article from the mold.

4,555,552

PHENOLIC MODIFIED URETHANE ELASTOMER

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 24, 1982, Ser. No. 361,282

Int. Cl.⁴ C08G *71/04;* C08L *61/00*

U.S. Cl. 525—456 **6 Claims**

1. A process for preparing urethane elastomer having methylol phenolic groups grafted thereto which comprises masticating about 0.1–20 parts by weight of a methylol-p-alkyl phenolic material containing about 1–40 weight percent methylol groups, 100 parts by weight of urethane elastomer, and a graft forming amount of an activator to form a graft between the methylol phenolic material and urethane elastomer, and recovering a thermoplastic urethane elastomer having methylol-p-alkyl phenolic groups grafted thereto.

4,555,553

HYDROXYAROMATIC OLIGOMERS OF A MIXED CYANATE AND AROMATIC POLYAMINE AND EPOXY RESINS THEREOF

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 15, 1985, Ser. No. 702,699

Int. Cl.⁴ C08G *59/32, 59/26, 59/04*

U.S. Cl. 525—523 **11 Claims**

1. Hydroxyaromatic oligomer compositions containing both triazine groups and imino carbamate linkages prepared by

(I) reacting at a temperature and time sufficient to essentially complete the reaction

(A) at least one material having an average of more than one aromatic hydroxyl group per molecule with

(B) at least 0.01 but not more than 0.95 moles of at least one cyanogen halide per aromatic hydroxyl group in the presence of

(C) from about 0.01 to about 1.1 moles of a suitable base per aromatic hydroxyl group

and thereafter recovering the resultant cyanate-containing mixture; and

(II) co-oligomerizing the product resulting from (I) with

(D) an aromatic polyamine in an amount which provides a mole ratio of amine groups to cyanate groups of from about 0.01:1 to about 1:1 optionally

in the presence of

(E) a suitable co-oligomerization catalyst and at a temperature and time to essentially complete the co-oligomerization reaction.

4. An epoxy resin composition prepared by reacting an epihalohydrin with a hydroxyaromatic oligomer containing at least one triazine group and at least one imino carbamate linkage of claims 1, 2 or 3 and subsequently dehydrohalogenating the resultant halohydrin ether and thereafter recovering the resultant glycidyl ether product.

4,555,554

OLIGOMERIC VINYL ESTER RESIN COMPOSITIONS CONTAINING TRIAZINE GROUPS AND IMINO CARBAMATE LINKAGES

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 15, 1985, Ser. No. 702,700

Int. Cl.⁴ C08G *59/16*

U.S. Cl. 525—531 **40 Claims**

1. A vinyl ester resin composition prepared by reacting

(A) a polyepoxide of a hydroxyaromatic oligomer containing at least one triazine group and at least one imino carbamate linkage or mixture of such polyepoxides; with

(B) a monounsaturated monocarboxylic acid or mixture of such acids; in the presence of

(C) a catalytic quantity of a suitable catalyst for effecting a reaction between components (A) and (B);

wherein components (A) and (B) are employed in amounts which provides from about 0.75 to about 1.2 mole of component (B) per epoxide group present in component (A).

4,555,555

PROCESS FOR POLYMERIZING VINYL CHLORIDE WITH A SCALE PREVENTION COMPOUND COATED ON A REACTION SURFACE

Eietsu Toyooka; Yoshio Tomishima, and Yasuhiro Nojima, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 344,266, Jan. 28, 1982, abandoned. This application Jan. 17, 1984, Ser. No. 571,418

Claims priority, application Japan, May 22, 1981, 56-78388; May 22, 1981, 56-78389

Int. Cl.⁴ C08F *2/34, 2/16*

U.S. Cl. 526—62 **6 Claims**

1. In a process for polymerizing vinyl chloride alone or a monomeric mixture of vinyl chloride as a major component and other monomers copolymerizable therewith as a minor component, the improvement which comprises coating, prior to the polymerization, the surfaces of a polymerization reactor, agitator blades and a reflux condenser positioned to the polymerization reactor, with a reaction product obtained by the reaction of a phenolic compound selected from the group consisting of pyrogallol and hydroxyhydroquinone with benzaldehyde, wherein said reaction product has an average molecular weight of from 3,000 to 10,000 and is coated onto said surfaces in a range from about 0.001 g/m^2 to about 0.2 g/m^2.

4,555,556

TERTIARY PERFLUORINATED COMPOUNDS AS RATE ENHANCING ADDITIVES IN PTFE DISPERSION POLYMERIZATION

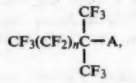
Aleksander Beresniewicz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 12, 1985, Ser. No. 711,054

Int. Cl.⁴ C08F *2/24*

U.S. Cl. 526—212 **9 Claims**

1. In a process for producing a colloidal dispersion of polytetrafluoroethylene homopolymer or copolymers of tetrafluoroethylene and ethylenically unsaturated comonomers by polymerizing tetrafluoroethylene and, optionally, ethylenically unsaturated comonomers, in an aqueous medium in the presence of a suitable initiator and a surfactant, the improvement comprising use as a rate enhancing additive of a compound of the formula



wherein

A is —OH, —COOH, —NH_2, or —C(O)NH_2; and n is 0, 1 or 2.

4,555,557

MALEIC ACID/(METH)ACRYLIC ACID COPOLYMER

Yasuhisa Fukumoto, and Noboru Moriyama, both of Utsunomiya, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Division of Ser. No. 360,518, Mar. 22, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 597,987
Claims priority, application Japan, Apr. 13, 1981, 56-55351
Int. Cl.[4] C08F *220/04*
U.S. Cl. 526—240 **6 Claims**

1. A process for producing an alkali metal salt of a copolymer of (1) maleic acid (MA) and (2) a vinyl carboxylic acid (AA) selected from the group consisting of acrylic acid and methacrylic acid, wherein the molar ratio (γ) of monomer units of (MA) to monomer units of (AA) in said copolymer is from 1.15 to 2.7, the number average molecular weight MW is from 1,000 to 8,000, and the product of (γ)×MW is at least 3,000, which comprises: gradually adding to (a) an aqueous solution of an alkali metal monomaleate having a pH of from 3.5 to 5.0, (b) said vinyl carboxylic acid or said acid which has been partly neutralized with an alkali metal neutralizing agent, and (c) a polymerization initiator effective to initiate copolymerization of said alkali metal monomaleate and said vinyl carboxylic acid, under conditions effective to copolymerize said vinyl carboxylic acid and said alkali metal monomaleate, the mol ratio of the total maleic acid monomer units to the total vinyl carboxylic acid monomer units added to said solution being in the range of from 1.2/1.0 to 3.0/1.0, and the solution being continuously maintained at a pH in the range of from 3.5 to 5.0 during the addition, whereby to form said copolymer.

4,555,558

TERPOLYMERS OF 2-ACRYLAMIDO-2-METHYLPROPANE-SULFONIC ACID, SODIUM SALT (AMPS), N,N-DIMETHYLACRYLAMIDE, AND ACRYLONITRILE

David M. Giddings, Sugar Land; Donald G. Ries, and Allen R. Syrinek, both of Richmond, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 530,569, Sep. 9, 1983, Pat. No. 4,502,964. This application Oct. 25, 1984, Ser. No. 664,631
Int. Cl.[4] C08F *228/02*
U.S. Cl. 526—287 **3 Claims**

1. A novel water-soluble terpolymer having a molecular weight below 1,000,000 comprising:

Ingredients	Mole %
2-acrylamido-2-methylpropane-sulfonic acid, sodium salt (AMPS)	51-59
N,N—dimethylacrylamide	6-28
acrylonitrile	20-35

4,555,559

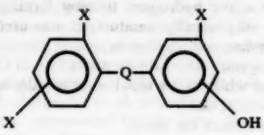
METHOD FOR MAKING NOVEL COPOLYMER

Hiroshi Kimura; Ikurou Mori, and Bunjirou Murai, all of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

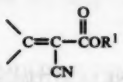
Filed Feb. 1, 1985, Ser. No. 697,357
Claims priority, application Japan, Feb. 9, 1984, 59-20892
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—16 **5 Claims**

1. A method for making a novel copolymer, which comprises: reacting

(A) a compound represented by the formula:



wherein Q represents >C=O or the following formula:



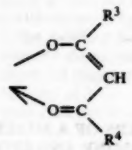
wherein each X may be either the same or different and each represents hydrogen atom or hydroxyl group, of which at least one is hydroxyl group, and R^1 represents an alkyl group having 1 to 18 carbon atoms, with

(B) an epoxy group-containing trialkoxysilane and/or an epoxy group-containing dialkoxysilane in the presence of

(C) an aluminum chelate compound represented by the formula:

$$Al(OR^2)_nL_{3-n}$$

wherein R^2 represents an alkyl group having 1 to 4 carbon atoms, L represents the following formula:



where R^3 represents an alkyl group having 1 or 2 carbon atoms, R^4 represents an alkyl group or an alkoxy group each having 1 or 2 carbon atoms,

and n is an integer of 0, 1 or 2.

4,555,560

ROOM TEMPERATURE VULCANIZABLE POLYORGANOSILOXANE COMPOSITIONS CONTAINING KETOXIMOSILANES AND ORGANOTITANATES

Toshio Saruyama, Narashino, and Ryuzo Mikami, Ichihara, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,664
Claims priority, application Japan, Jul. 21, 1983, 58-133136
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—17 **9 Claims**

1. A room temperature vulcanizable polyorganosiloxane composition consisting essentially of the product obtained by mixing

(A) 100 parts by weight of a polyorganosiloxane which has a viscosity at 25° C. of 0.001 to 0.2 m^2/s, has at least two terminal silanol groups per molecule, contains ≦2 weight percent components with a polystyrene-based molecular weight of ≦5,000 according to the gel permeation chromatogram, and has organic radicals selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals,

(B) 0.5 to 30 parts by weight of a ketoxime silicon compound selected from silane of the general formula

$$RSi(O—N=X)_3$$

or its partial hydrolysis product wherein R represents a radical selected from the group consisting of alkyl, alkenyl, and phenyl, X represents $=CR_2'$ or $=CR^2$, each R' represents a monovalent hydrocarbon radical, and each R^2 represents a divalent hydrocarbon radical, and

(C) 0.005 to 2 parts by weight of an organotitanate ester.

4,555,561

POLYURETHANE RESIN COMPOSITION

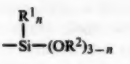
Masaru Sugimori, and Koichiro Sanji, both of Takatsuki, Japan, assignors to Sun Star Giken Kabushiki Kaisha, Takatsuki, Japan

Filed Aug. 24, 1984, Ser. No. 643,700
Claims priority, application Japan, Sep. 7, 1983, 58-165424
Int. Cl.[4] C08G *77/26, 18/66;* **C08K** *9/06*
U.S. Cl. 528—26 **4 Claims**

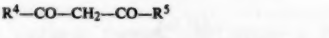
1. A polyurethane resin composition comprising

(A) a urethane prepolymer composition containing 0.5 to 15.0% by weight based on said prepolymer composition of an active isocyanate group, said prepolymer composition prepared by reacting (1) a polyoxyalkylene ether polyol and/or polyester polyol and (2) a stoichiometric excess of a polyisocyanate compound and

(B) 0.05 to 5.0% by weight based on the polyurethane resin composition of a reaction product of (1) an amine compound having a primary and/or secondary amino group and containing at least one alkoxysilyl group of the formula:



wherein R^1 and R^2 are the same or different and are each alkyl having 1 to 4 carbon atoms and n is 0, 1 or 2, and (2) a stoichiometrically equivalent or excess amount of a carbonyl compound selected from the group consisting of an aldehyde, a cyclic ketone, an aliphatic ketone, and a β-dicarbonyl compound of the formula:



wherein R^4 and R^5 are the same or different and each are an alkyl having 1 to 16 carbon atoms, an aryl having 6 to 12 carbon atoms, or an alkoxy having 1 to 4 carbon atoms, said reaction product containing enamine or ketimine groups formed by a dehydration condensation reaction of the carbonyl group of said carbonyl compound with the primary and/or secondary amino group of said amine compound.

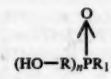
4,555,562

POLYURETHANE ELASTOMER COMPOSITION

Fui-Tseng H. Lee, Princeton, and Joseph Green, East Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 476,163, Mar. 17, 1983. This application Feb. 27, 1984, Ser. No. 584,021
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.[4] C08G *18/38*
U.S. Cl. 528—72 **5 Claims**

1. A polyurethane elastomer product of an NCO terminated elastomer prepolymer formed from a polyol selected from the class consisting of dihydroxy functional polyethers and polyesters cured with a mixture of polyhydroxyalkyl phosphine oxides of the formula:



wherein R is alkylene of 3 to 6 carbon atoms, R_1 is alkyl of 2 to 10 carbon atoms, cycloalkyl of 6 to 12 carbon atoms and n is an integer of 2 to 3, it being provided that the said mixture contains a minor amount of the phosphine oxide wherein n is 3 and a major amount of the phosphine oxide wherein n is 2.

4,555,563

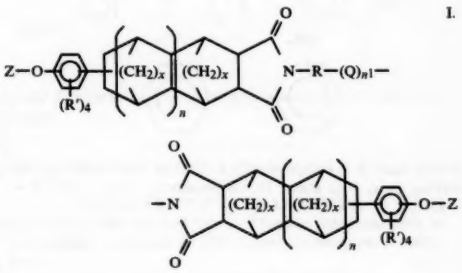
IMIDE FUNCTIONAL POLYPHENOLS; THERMOSETTABLE COMPOSITIONS CONTAINING SAME AND CURED PRODUCTS THEREFROM

Robert E. Hefner, Jr., and Mary N. White, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

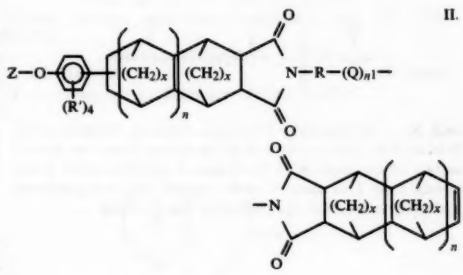
Filed Dec. 7, 1984, Ser. No. 679,529
Int. Cl.[4] C08G *59/26, 59/32, 73/06, 73/10*
U.S. Cl. 528—96 **9 Claims**

1. A composition comprising any one or a combination of any two or more of the materials represented by formulas I and II

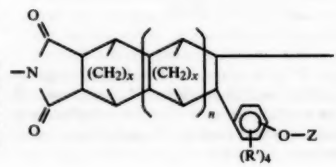
I.



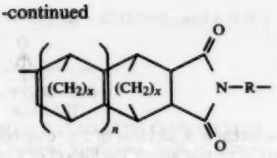
II.



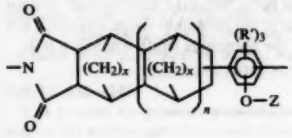
wherein each Q is independently

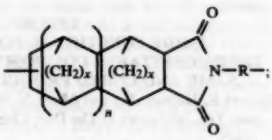


-continued

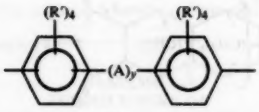


or

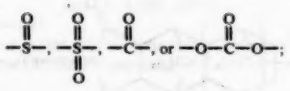




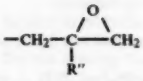
each R is independently a hydrocarbyl group having from 1 to about 10 carbon atoms or a



group; each A is independently a divalent hydrocarbyl group having from 1 to about 10, carbonatoms, —S—, —S—S—, —O—,



each R' is independently hydrogen, chlorine, bromine, a hydrocarbyl or hydro-carbyloxy group having from 1 to about 3 carbon atoms; each R'' is hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; Z is independently hydrogen or a group represented by the formulas



or —C≡N wherein R'' is hydrogen or a hydrocarbyl group having from 1 to about 4 carbon atoms; each x has a value of zero or 1; each y has a value of zero or 1; each n independently has an average value from zero to about 20, and n^1 has a value from zero to about 10.

4,555,564

ALKYD RESINS CONTAINING HYDROXYL GROUPS

Herbert Fischer; Manfred Gorzinski, both of Duesseldorf; Wolfgang Gress, Wuppertal-Elberfeld; Alfred Meffert, Monheim, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 612,754, May 21, 1984. This application Mar. 27, 1985, Ser. No. 716,596

Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318595

Int. Cl.[4] C08G *63/54*

U.S. Cl. 528—295.3 **31 Claims**

1. A process for synthesizing alkyd resin compositions comprising:

(A) condensing a carboxylic acid with an alcohol to form a polyester precondensate having terminal hydroxyl groups, wherein

(1) said carboxylic acid is a fatty acid, a polycarboxylic acid, a reactive derivative thereof, or any mixture thereof,

(2) said alcohol is at least one polyfunctional alcohol, and said condensation reaction is conducted at a temperature of about from 120° to 220° C. and is continued until the acid number of the precondensate is less than 2;

(B) converting said precondensate into an acidic precondensate by further condensation with a polycarboxylic acid anhydride wherein

(1) said polycarboxylic acid anhydride is a dicarboxylic acid anhydride, a tricarboxylic acid anhydride, a higher polycarboxylic acid anhydride, or any mixture thereof, and said further condensation is conducted at a temperature of about from 140° to 200° C. and continued until an acid number of about 50 to 130 is obtained; and

(C) forming an alkyd resin by further esterification of said acidic precondensate with a further alcohol wherein

(1) said further alcohol is at least one polyol having a functionality of from 3 to 10 or any mixture thereof, and said further esterification reaction is conducted at a temperature of about from 120° to 220° C. and is continued until an acid number of about 10 to 40 is obtained.

4,555,565

RING-CHAIN POLYMER CONTAINING TRIARYL-S-TRIAZINE RING AND OTHER HEAT-RESISTANT HETEROCYCLIC RINGS

Li-Chen Hsu, 6422 Grandvale, Houston, Tex. 77072

Filed Mar. 31, 1983, Ser. No. 480,705

Int. Cl.[4] C08G *73/06*

U.S. Cl. 528—322 **9 Claims**

1. In a process for preparing triaryl-s-triazine ring containing polymers by heating together a aromatic nitrile with an aromatic nitrile appended or terminated oligomer, the improvement comprising:

contacting a mole percent excess of said aromatic nitrile with said aromatic nitrile terminated or appended oligomer selected from imide, benzimiazole, imidazopyrone, or quinoxaline nitrile-modified oligomers, the mole percent of said aromatic nitrile being in at least 5 mole percent in excess of the moles of said aromatic nitrile required to react with said aromatic nitrile terminated or appended oligomer, and reacting said aromatic nitrile with said aromatic nitrile terminated or appended oligomer to produce a nitrile capped oligomer; and

cyclotrimerizing said nitrile-capped oligomer and excess aromatic nitrile mixture in contact with a trimerization catalyst at temperatures above 100° C. and at pressures above 200 PSI to produce a partly crosslinked or substantially non-crosslinked triaryl-s-triazine ring containing chain extended polymer.

4,555,566

COPOLYMER POLYAMIDE RESIN CONTAINING POLYOLEFIN MOIETY

Koichiro Arita, and Hajime Suzuki, both of Himeji, Japan, assignors to Daicel Chemical Industries, Co., Ltd., Sakai, Japan

PCT No. PCT/JP82/00068, § 371 Date Oct. 12, 1982, § 102(e) Date Oct. 12, 1982, PCT Pub. No. WO82/03219, PCT Pub. Date Sep. 30, 1982
Continuation of Ser. No. 440,215, Oct. 12, 1982, abandoned.
This PCT application Mar. 16, 1982, Ser. No. 651,633
Claims priority, application Japan, Mar. 16, 1981, 56-38374; Jun. 30, 1981, 56-102047; Mar. 9, 1982, 57-36910
Int. Cl.[4] C08G 69/02, 69/14, 69/26, 63/00
U.S. Cl. 528—323 11 Claims

1. A polyamide-modified hydrogenated polyolefin block copolymer resin which consists essentially of (A) 99 to 5 parts by weight of a polyamide component consisting essentially of repeating units selected from the group consisting of (1) $-NH(CH_2)_nCO-$, wherein n is an integer of from 5 to 11, (2) —NH—X—NHCO—Y—CO—, wherein X is $-C_mH_{2m}-$ in which m is an integer of from 6 to 12, isophorone, phenylene or cyclohexylene, and Y is $-C_lH_{2l}-$ in which l is an integer of from 4 to 10, phenylene, or cyclohexylene, copolymerized with (B) 1 to 95 parts by weight of hydrogenated polyolefin blocks consisting essentially of repeating hydrogenated olefin units; said hydrogenated polyolefin blocks being derived from a hydrogenated polyolefin having a pair of terminal hydroxyl groups and derived from an olefin monomer having at least two double bonds, said hydrogenated polyolefin blocks having a number-average molecular weight in the range of 500 to 10,000 and having a double bond hydrogenation ratio of greater than 70%, said block copolymer resin having a number-average molecular weight in the range of 5,000 to 500,000.

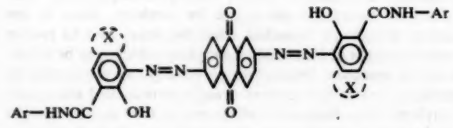
4,555,567

2,6-DISAZO ANTHRAQUINONE COMPOUNDS

Mitsuru Hashimoto, Numazu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 385,341, Jun. 4, 1982, Pat. No. 4,440,845.
This application Sep. 30, 1983, Ser. No. 537,774
Claims priority, application Japan, Jun. 8, 1981, 56-87845; Jun. 8, 1981, 56-87846
Int. Cl.[4] C09B 33/02, 35/02, 56/12; G03G 5/06
U.S. Cl. 534—654 18 Claims

1. A disazo compound having the formula:



wherein X is selected from the group consisting of benzo, naphtho, indolo, carbazolo, benzofurano and halogen-substituted derivatives thereof, and Ar is selected from the group consisting of phenyl, naphthyl, dibenzofuranyl, carbazolyl, and substituted derivatives thereof, wherein the substituent on said substituted derivative is one or more members selected from the group consisting of lower alkyl, lower alkoxy, halogen, trifluoromethyl, cyano, nitro, carboxyl, —COOR wherein R is lower alkyl, di(lower alkyl)amino and $-SO_3Na$.

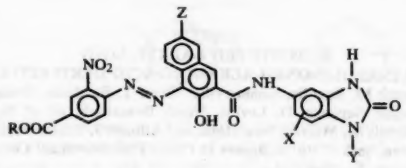
4,555,568

MONOAZO COMPOUNDS DERIVED FROM 3-NITRO-4-AMINO-BENZOATES AND 5-(2'-HYDROXY-3'-NAPHTHOYLAMINO)-BENZIMIDAZOLONES

Klaüs Hünger, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

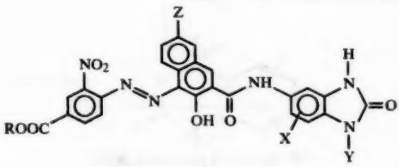
Filed Jun. 23, 1980, Ser. No. 162,074
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1979, 2925542
Int. Cl.[4] C09B 29/01, 29/15; D06P 1/44, 3/24
U.S. Cl. 534—801 2 Claims

1. A compound of the formula



wherein R is ethyl and X, Y and Z are hydrogen.

2. A compound of the formula



wherein R is methyl, X is methyl in 6-position and Y and Z are hydrogen.

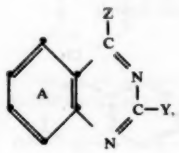
4,555,569

CHROMOGENIC QUINAZOLINES

Rudolf Zink, Therwil, and Ian J. Fletcher, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,687
Claims priority, application Switzerland, Jun. 28, 1983, 3522/83
Int. Cl.[4] C07D 403/02, 413/02
U.S. Cl. 544—105 14 Claims

1. A chromogenic quinazoline of the formula



(I)

wherein

Y is a polycyclic non-aromatic heterocyclic radical selected from an indoline, tetrahydroquinoline or benzomorpholine radical which is attached to the quinazoline moiety through a fused benzene nucleus and is unsubstituted or substituted, and

Z is hydrogen, R, $-OR_1$, $-SR_1$ or $-NR_2R_3$, wherein

R and R_1 are each alkyl which contains not more than 12 carbon atoms and is unsubstituted or substituted by cyano or lower alkoxy, or are cycloalkyl, unsubstituted or substi-

tuted aryl or aralkyl or an unsubstituted or substituted heterocyclic radical, and R_1 is also C_2–C_6haloalkyl,

R_2 and R_3, each independently of the other, are hydrogen, alkyl which contains not more than 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxy, cyano or lower alkoxy, or are cycloalkyl, phenyl, benzyl, or phenyl or benzyl which are each substituted by halogen, nitro, cyano, lower alkyl, lower alkoxy or lower alkoxycarbonyl, and R_2 is also C_1–C_{12}acyl; or R_2 and R_3, together with the nitrogen atom to which they are attached, are a 5- or 6-membered, saturated heterocyclic radical,

and the ring A is unsubstituted or substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy or lower alkoxycarbonyl.

4,555,570

SUBSTITUTED 4-ALKYL-2-(1H) QUINAZOLINONE-1-ALKANOIC ACID DERIVATIVES

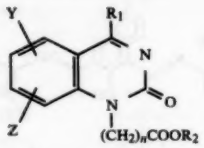
Ramesh M. Kanojia, Sommerville; Victor T. Bandurco, Bridgewater; Seymour D. Levine, North Brunswick, all of N.J.; Dennis M. Mulvey, New Hope, and Alfonso J. Tobia, Doylestown, both of Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 29, 1983, Ser. No. 537,232

Int. Cl.[4] C07D *239/80;* **A61K** *31/505*

U.S. Cl. 544—286 **4 Claims**

1. A compound of the formula:



wherein n is an integer from 2–6; R_1 is lower alkyl; R_2 is hydrogen and lower alkyl; and Y and Z are hydroxy and lower alkoxy; and the pharmaceutically acceptable acid addition salts thereof; provided that Y and Z are not hydroxy at the same time in the 5,6 or 6,7 position.

4,555,571

SUBSTITUTED 2(1H)-QUINAZOLINONE-1-ALKANOIC ACIDS AND ESTERS

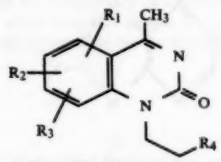
Victor T. Bandurco, Bridgewater; Seymour D. Levine, North Brunswick, both of N.J.; Dennis M. Mulvey, New Hope, and Alfonso J. Tobia, Doylestown, both of Pa., assignors to Ortho Pharmaceutical Corporation, Rawritan, N.J.

Filed Sep. 29, 1983, Ser. No. 537,233

Int. Cl.[4] C07D *239/80, 403/04, 413/04;* **A61K** *31/505*

U.S. Cl. 544—286 **4 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl, lower alkoxy, morpholino, methyl piperazino, hydroxy, alkoxycarbonyloxy wherein the alkoxy group has 1–4 carbon atoms, alkylamino having 1–4 carbon atoms, halo, ureido, alkylthio, alkyl sulfinyl and alkanoyloxy having 2–5 carbon atoms; R_2 is hydrogen, lower alkoxy, alkoxycarbonyloxy, hydroxy, alkylamino and alkanoyloxy; R_3 is hydrogen, hydroxy and lower alkoxy; and R_4 is carboxy and carboalkoxy wherein the alkoxy group has 1–3 carbon atoms; and the pharmaceutically acceptable acid addition salts thereof, provided that R_1, R_2 and R_3 are not simultaneously hydrogen.

4,555,572

PYRAZOLO[3,4,5-KL]ACRIDINE COMPOSITIONS AND METHODS FOR THEIR PRODUCTION AND USE

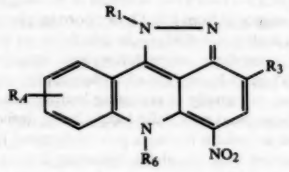
David B. Capps, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 515,125, Jul. 19, 1983, abandoned. This application Jun. 15, 1984, Ser. No. 619,258

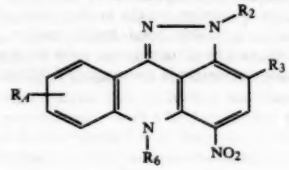
Int. Cl.[4] C07D *471/02;* **A61K** *31/41*

U.S. Cl. 546—14 **30 Claims**

1. Pyrazolo[3,4,5-kl]acridine compounds having in free base form the formulas 1 and 2:



1



2

and the pharmaceutically acceptable salts thereof, where R_1 and R_2 are each -alkylene-NR_xR_y where alkylene is two to four carbon straight or branched chain alkylene which can be substituted by hydroxyl, and R_x and R_y are each independently H, one to four carbon straight or branched chain alkyl, or two to four carbon straight or branched chain hydroxyalkyl, or combined with said nitrogen represent piperidyl or pyrrolidyl, when R_x and R_y are both alkyl, the amine may be an N-oxide; R_3 is H or NO_2; R_6 is H or one to three carbon straight or branched chain alkyl; R_4 is H or one or two groups selected from hydroxy, chloro, amino, one to four carbon straight or branched alkylamino or dialkylamino optionally substituted by methoxy, one to four carbon straight or branched alkyl; one to six carbon straight or branched alkoxy which may be substituted by methoxy, dimethylaminoethoxy, dimethylaminopropoxy, diethylaminoethoxy, diethylaminopropoxy, benzyloxy or benzyloxy substituted by methoxy, three to ten carbon straight or branched trialkylsilyloxy, two to twelve carbon straight or branched alkanoyloxy which may be substituted by methoxy, benzoyloxy or benzoyloxy substituted by methoxy, one to four carbon straight or branched alkoxycarbonyloxy, benzyloxycarbonyloxy one to four carbon straight or branched alkylaminocarbonyloxy or dialkylaminocarbonyloxy.

29. An antitumor, antileukemic, or antimicrobial composition comprising an effective amount of a compound having the formula 1 according to claim 1 in combination with a pharmaceutically acceptable carrier.

30. An antitumor, antileukemic, or antimicrobial composition comprising an effective amount of a compound having the formula 2 according to claim 1 in combination with a pharmaceutically acceptable carrier.

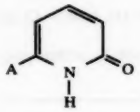
4,555,573

CERTAIN 6-BENZAMIDOMETHYL-2(1H)-PYRIDONE DERIVATIVES

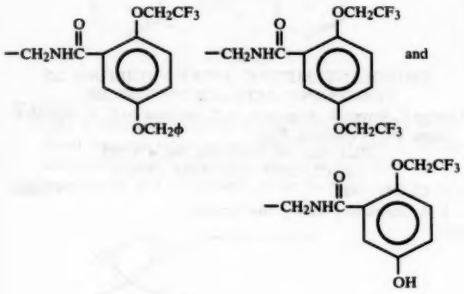
William R. Bronn, Maplewood, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Nov. 15, 1983, Ser. No. 551,967
Int. Cl.[4] C07D *213/56*
U.S. Cl. 546—291 3 Claims

1. A compound of the formula



wherein A is selected from the group consisting of



and

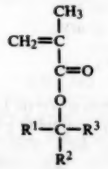
4,555,574

METHACRYLIC ESTER USEFUL AS AN OPTICAL RESOLVING AGENT

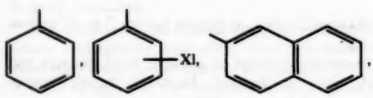
Heimei Yuki, Sakai, and Yoshio Okamoto, Amagasaki, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Division of Ser. No. 389,631, Jun. 16, 1982, Pat. No. 4,473,690. This application Jul. 11, 1984, Ser. No. 630,477
Claims priority, application Japan, Jun. 19, 1981, 56-94875
Int. Cl.[4] C07D *211/70*
U.S. Cl. 546—342 3 Claims

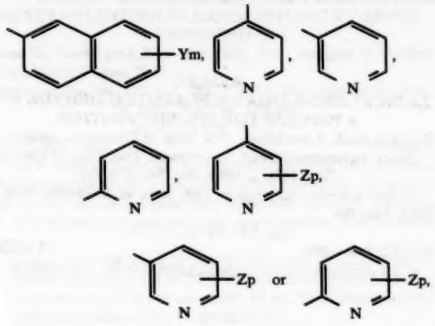
1. A methacrylic ester of the following formula:



wherein R^1, R^2 and R^3 may be the same or different and each represent



-continued



X, Y and Z represent an alkyl, alkoxy or aromatic group and l, m and p represent the number of each substituent which is an integer of 1 to 3, with the proviso that all of R^1, R^2 and R^3 should not represent

at the same time.

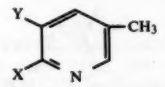
4,555,575

PROCESS FOR PREPARING 2,3-DICHLORO-5-TRICHLOROMETHYLPYRIDINE

David Cartwright, Woodley, England, assignor to Imperial Chemical Industries, plc, London, England

Continuation of Ser. No. 29,341, filed as PCT GB 78/00008, Aug. 10, 1978, published as WO 79/00094 Mar. 8, 1979, § 102(e) date Apr. 11, 1979. This application Feb. 6, 1985, Ser. No. 698,690
Claims priority, application United Kingdom, Aug. 12, 1977, 34039/77; Oct. 26, 1977, 44541/77; Feb. 9, 1978, 5230/78
Int. Cl.[4] C07D *213/26*
U.S. Cl. 546—345 1 Claim

1. A liquid phase process for preparing 2,3-dichloro-5-trichloromethylpyridine, said process consisting essentially of contacting with chlorine the hydrochloride salt of a 2,3-disubstituted-5-methylpyridine of formula



wherein X and Y are halogen atoms selected from bromine and chlorine, in a dry inert organic liquid medium under the influence of UV light.

4,555,576

4,5-DIHYDROTHIAZOLES AND PREPARATION THEREOF

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 146,905, May 5, 1980, abandoned. This application May 21, 1984, Ser. No. 612,155
Int. Cl.[4] C07D *277/10*
U.S. Cl. 548—146 9 Claims

1. A process of preparing a 4,5-dihydrothiazole which comprises heating to a temperature above 160° C., a 2,5-dihydro-

thiazole or a mixture comprising an aliphatic aza-alkylene diene and sulfur which is a precursor thereof.

4,555,577

2,4-DICHLORO-5-THIAZOLECARBOXALDEHYDE AND A PROCESS FOR ITS PREPARATION

Gunther Beck, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

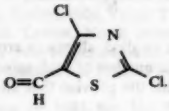
Filed Feb. 2, 1984, Ser. No. 576,183

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303704

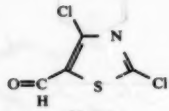
Int. Cl.⁴ C07D *277/20*

U.S. Cl. 548—200 **5 Claims**

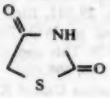
1. 2,4-dichloro-5-thiazolecarboxaldehyde of the formula



2. A process for preparing a 2,4-dichlor-5-thiazolecarboxaldehyde of the formula

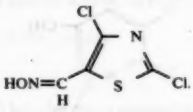


which comprises contacting, 2,4-thiazolidinedione of the formula



with 1–1.5 mols of dimethylformamide and 3–10 mol of phosphorus oxychloride at the reflux temperature of the reaction mixture until evolution of hydrogen chloride gas has ceased and thereafter working up the reaction mixture hydrolytically.

5. 2,4-dichloro-5-thiazolecarboxaldehyde oxime of the formula



4,555,578

MERCAPTOTETRAZOLYLALKANOHYDROXAMIC ACIDS, SALTS AND ESTER THEREOF

Wataru Nagata, Hyogo, and Tsutomu Aoki, Osaka, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

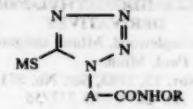
Filed May 11, 1983, Ser. No. 493,573

Claims priority, application Japan, May 13, 1982, 57-81128

Int. Cl.⁴ C07D *257/04*

U.S. Cl. 548—251 **15 Claims**

1. A tetrazolylalkanohydroxamic acid or its ester represented by the following formula:



wherein A is methylene, ethylene or propylene; M is a hydrogen or light metal atom; and R is methyl, ethyl or isopropyl.

4,555,579

DIOXOLENYLMETHYL ESTER PRODRUGS OF PHOSPHINIC ACID ACE INHIBITORS

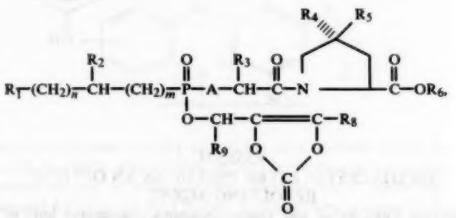
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 24, 1983, Ser. No. 478,598

Int. Cl.⁴ C07F *9/65;* **A61K** *31/675*

U.S. Cl. 548—409 **9 Claims**

1. A compound having the formula



or a salt thereof, wherein R_1 is hydrogen, aryl or heteroaryl;

R_2 is hydrogen, amino, alkanoylamino, arylcarbonylamino, or heteroarylcarbonylamino;

R_3 is hydrogen, alkyl, or aminoalkyl,

R_4 and R_5 are the same or different and each is hydrogen, alkyl, halogen, aryl, arylalkyl, hydroxy, alkoxy, alkylthio, aryloxy, arylthio, or cycloalkyl, or R_4 and R_5 taken together are oxo, ethylenedithio or propylenedithio;

R_6 is hydrogen, alkyl or aryl;

R_8 is hydrogen, alkyl or aryl;

R_9 is hydrogen or alkyl;

n is 0 or an integer of 1 to 8;

m is 0 or 1; and

A is $-(CH_2)_p-$ wherein p is 0 or 1, —NH—, or —O—;

wherein the term "aryl" refers to phenyl or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino, or trifluoromethyl groups;

the term "alkyl" refers to groups having 1 to 10 carbon atoms;

the term "alkoxy" refers to groups having 1 to 8 carbon atoms;

the term "alkanoyl" refers to groups having 2 to 10 carbon atoms; and

the term "heteroaryl" refers to pyridyl, furyl, thienyl, pyrimidinyl, quinolyl, indolyl, benzothiophenyl, benzothiazolyl, purinyl, benzoxazolyl, or thiazolyl.

4,555,580

PROCESS FOR THE PREPARATION OF THIOINDIGO COMPOUNDS

Detlef-Ingo Schütze, Bergisch-Gladbach; Reinold Schmitz, Odenthal, and Klaus Wunderlich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

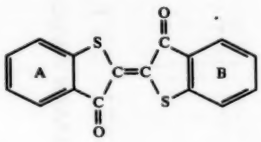
Continuation of Ser. No. 367,694, Apr. 12, 1982, abandoned. This application Sep. 26, 1983, Ser. No. 535,543

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3117055

Int. Cl.[4] C07D *333/24*

U.S. Cl. 549—52 15 Claims

1. Process for the preparation of thioindigo compounds of the formula

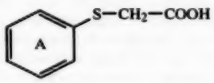


(I)

in which

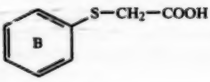
A and B designate identical or different, optionally substituted benzene rings or benzene rings to which further carbocyclic and heterocyclic rings can be fused,

characterised in that compounds of the formula



(IIa)

and/or



(IIb)

in which

A and B have the abovementioned meaning, are reacted in a mixture of chlorosulphonic acid and a further halide of an inorganic acid, and the resulting reaction product is oxidised in a manner which is in itself known and the batch is worked up to give compounds of the formula (I).

4,555,581

PROCESS FOR THE PRODUCTION OF 7-OXABICYCLO (2.2.1)HEPT-5-ENE DERIVATIVES

Alfons Landscheidt, Krefeld, Fed. Rep. of Germany, assignor to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,533

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235399

Int. Cl.[4] C07D *307/00*

U.S. Cl. 549—463 10 Claims

1. A process for the production of a 7-oxabicyclo(2.2.1)hept-5-ene 2-carboxylic acid alkyl ester compound, comprising reacting a furan and an ester of acrylic acid with an alcohol of 1 to 22 C-atoms in the presence of a catalytic quantity of a Lewis acid.

4,555,582

CATALYTIC PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES [WITH SUPPORTED CATALYST]

Steven H. Vanderpool, New Braunfels, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 455,154, Jan. 3, 1983. This application Nov. 23, 1984, Ser. No. 674,453

Int. Cl.[4] C07C *85/06*

U.S. Cl. 564—479 6 Claims

1. In a method wherein monoethanolamine is reacted with ethylenediamine in the presence of a phosphorous containing catalyst to provide an essentially noncyclic product comprising polyethylenepolyamines, the improvement which comprises:

a. using, as a catalyst, a thermally activated pelleted composition consisting essentially of zirconium silicate having from about 0.5 wt.% to about 10 wt.% of phosphorous thermally chemically bonded thereto,

b. continuously contacting a mixture of ethylenediamine and monoethanolamine in a molar ratio of about 1 to about 5 mols of ethylenediamine per mole of monoethanolamine with said pelleted catalyst at a temperature of about 250° to about 400° C. and a pressure of about 500 to about 3000 psig. to obtain an essentially noncyclic product.

4,555,583

PREPARATION PROCESS FOR GLYOXAL

Yoshiaki Toyoda, Takaishi; Kazuo Wakimura, Sennan; Tadaharu Hase, and Nobumasa Arashiba, both of Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP83/00283, § 371 Date Mar. 28, 1984, § 102(e) Date Mar. 28, 1984, PCT Pub. No. WO84/00955, PCT Pub. Date Mar. 15, 1984

PCT Filed Aug. 30, 1983, Ser. No. 597,067

Claims priority, application Japan, Aug. 30, 1982, 57-149351; Aug. 31, 1982, 57-150082

Int. Cl.[4] C07C *45/29*

U.S. Cl. 568—473 8 Claims

1. A process for preparing glyoxal by subjecting ethylene glycol to gas-phase oxidation, which process comprises bringing the ethylene glycol and a gas containing molecular oxygen into contact at a temperture in the range of 450°–650° C. with a silver catalyst in the simultaneous feeding of one or more phosphorus compounds in a vapor phase to effect the oxidation of the ethylene glycol, the amount of the molecular oxygen used is 0.7–2.0 moles per mole of the ethylene glycol and the amount of the fed phosphorus compounds is 50 ppm or less as calculated in terms of phosphorus relative to the ethylene glycol.

4,555,584

PROCESS FOR PRODUCING CONJUGATED DIENES

Paul R. Robinson, Costa Mesa, and Eric L. Moorehead, Diamond Bar, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Division of Ser. No. 328,446, Dec. 7, 1981, Pat. No. 4,454,245. This application Mar. 21, 1984, Ser. No. 592,422

Int. Cl.[4] C07C *5/333, 5/03, 5/09*

U.S. Cl. 585—623 27 Claims

1. A method for producing diolefins from monolefins which comprises reacting a feedstream comprising a gas containing helium, molecular oxygen and a C_4 and C_8 mono-olefin under reaction conditions, in contact with an oxidative dehydrogenation catalyst defined by the formula:

$$Me_aV_bP_cSn_dO_eX$$

wherein X is mordenite, Me is an alkali metal, a is 0.10 to 2, b is 0.10 to 1, c is 1, d is 0.001 to 0.30 and e is a number which satisfies the valence requirements of the other elements present.

4,555,585

FOLDABLE SOLAR CELL PANEL APPARATUS

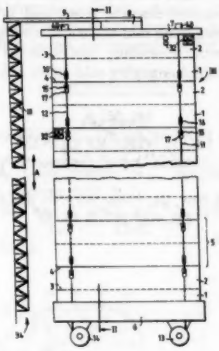
Günter Behrens, Hamburg; Walter Schmitz, Wedel; Peter Kitzer, Hamburg, and Dieter Rüsch, Wedel, all of Fed. Rep. of Germany, assignors to Licentia Patent Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,879

Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316789

Int. Cl.[4] H01L *31/04*

U.S. Cl. 136—245 9 Claims



1. A foldable solar cell panel apparatus, comprising:

a solar cell generator panel having a top end, a bottom end, and an axis running through said top and bottom ends, said solar cell generator panel having a plurality of panel portions which are connected at foldable edges that are substantially perpendicular to said axis to form a plurality of foldable pairs of panel portions, the panel portions of said plurality of foldable pairs being movable between a folded state and an unfolded state;

a panel container disposed at said bottom end to store said foldable pairs when said foldable pairs are in their folded state; and

folding and unfolding system means, connected to said solar cell generator panel and to said panel container, for folding into said container the lowermost of said foldable pairs that is not already in its folded sate in the container while any foldable pairs above said lowermost foldable pair remain in their unfolded state so that foldable pairs that are being folded into said container are folded individually in succession, and for unfolding from said container the uppermost of said plurality of foldable pairs that is not already in its unfolded state outside the container while any foldable pairs below said uppermost foldable pair remain in their folded state so that foldable pairs that are being unfolded from said container are unfolded individually in succession, said folding and unfolding system means including

an end plate to which said top end of said solar cell generator panel is operationally connected,

a mast mechanism movable along a line substantially parallel to said axis of said solar cell generator panel and operationally connected to said end plate,

means for releasably fastening said plurality of foldable pairs of panel portions when said solar cell generator panel is being folded into said container, said means for releasably fastening including at least two cables each having a top end operationally secured to said end plate and a bottom end wound around a spring drum disposed below said bottom end of said solar cell generator panel, said means for releasably fastening providing releasably fastened connections between said cables and individual ones of said plurality of foldable pairs, and

holding mechanism means operationally connected to said container for preventing the unfolding of foldable pairs already in said container when said lowermost of said plurality of foldable pairs that is not already in its folded state in the container is being folded into said container and for preventing simultaneous unfolding or fanning out of a plurality of foldable pairs when said uppermost of said plurality of foldable pairs that is not already in its unfolded state outside the container is being unfolded from said container.

4,555,586

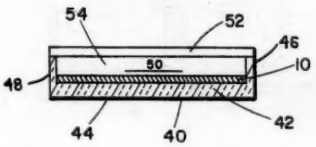
PHOTOVOLTIAC DEVICE HAVING LONG TERM ENERGY CONVERSION STABILITY AND METHOD OF PRODUCING SAME

Subhendu Guha, Clawson, and William DenBoer, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 6, 1984, Ser. No. 637,984

Int. Cl.[4] H01L *31/06*

U.S. Cl. 136—259 29 Claims



1. In a photoresponsive semiconductor device of the type which (1) generates electron-hole pairs in an intrinsic type photoactive region thereof in response to incident light; (2) separates and collects the electrons and holes; (3) develops light induced defects tending to deleteriously affect collection efficiency; and (4) is capable of having substantial numbers of said light induced defects removed by annealing said device at elevated temperatures; the improvement comprising in combination:

p-dopant means incorporated into at least a portion of the photoactive region for reducing the temperature at which said substantial number of light induced defects can be annealed out of the photoresponsive device to a temperature below the annealing temperature of material without the p-dopant means; and,

means for maintaining said photoresponsive device at said reduced annealing temperature for at least a portion of its operational lifetime, said temperature maintaining means including means for preventing loss of heat from said device; whereby light induced defects are at least periodically annealed out of the photoresponsive device during the operation thereof, so as to provide a photoresponsive device characterized by a relatively stable collection efficiency.

4,555,587

ENCLOSURE FOR A POWER SUPPLY

Michael A. Argentieri, West Orange, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,277

Int. Cl.[4] H05K *5/00, 7/20*

U.S. Cl. 174—11 R 15 Claims

1. An arrangement enclosing a power supply having a high voltage portion and a low voltage portion, comprising:

a closed housing having a wall therein dividing the interior of said housing into a first compartment containing the high voltage portion of the power supply and a second compartment containing the low voltage portion of the power supply;

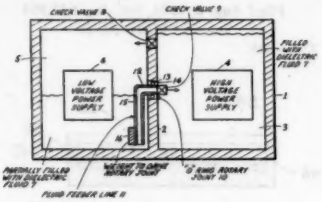
a dielectric fluid filling said first compartment and partially filling said second compartment;

a first check valve disposed in said wall to enable said fluid to flow from said first compartment to said second compartment during a temperature increase to compensate for expansion of said fluid in said first compartment; and

a second check valve disposed in said wall in communication with said fluid in said second compartment to enable said fluid to flow from said second compartment to said first compartment during a temperature decrease to maintain said first compartment full of said fluid.

4. An arrangement for enclosing a power supply having a high voltage portion and a low voltage portion, comprising

a closed housing having a wall therein dividing the interior of said housing into a first compartment for containing a high voltage portion of a power supply and a second compartment for containing a low voltage portion of a power supply;


CHECK VALVE 9
CHECK VALVE 9
FILLED WITH DIELECTRIC FLUID 7
LOW VOLTAGE POWER SUPPLY
HIGH VOLTAGE POWER SUPPLY
PARTIALLY FILLED WITH DIELECTRIC FLUID 7
FLUID FEEDER LINE 11

a dielectric fluid filling said first compartment and partially filling said second compartment;

a first check valve disposed in said wall to enable said fluid to flow from said first compartment to said second compartment during a temperature increase to compensate for expansion of said fluid in said first compartment;

a second check valve disposed in said wall in communication with said fluid in said second compartment to enable said fluid to flow from said second compartment to said first compartment during a temperature decrease to maintain said first compartment full of said fluid; and

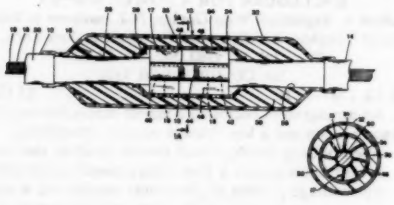
a fluid feeder device disposed in said second compartment operative at all times to have one end in communication with said second check valve and the other end submerged in said fluid of said second compartment independent of the attitude of said housing within a predetermined acceptable attitude range.

4,555,588

HEAT TRANSFER DEVICE FOR ELECTRICAL CONNECTOR IN INSULATING HOUSING OF HIGH VOLTAGE SPLICE OR TERMINATOR

John P. DuPont, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Oct. 26, 1983, Ser. No. 545,800
Int. Cl.⁴ H02G *15/064, 15/184*
U.S. Cl. 174—73 R **8 Claims**



1. In combination in a high voltage component such as a splice, terminator, elbow or the like:

an electrically insulating housing having a cavity therein and at least one passage in said housing communicating with said cavity;

a hollow electrically conductive stress relief insert in said cavity and connected to said insulating housing;

an electrical connector located within said hollow stress relief insert;

an electrical cable extending through said passage into said hollow stress relief insert and having an electrical conductor electrically and mechanically connected to said electrical connector;

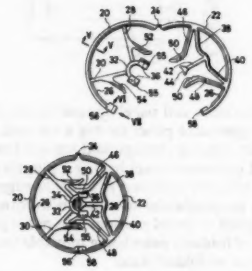
and an electrically and thermally conductive hollow elastic heat transfer device discrete from said housing and surrounding and engaging said electrical connector and having radially outwardly extending spaced apart projections on the exterior thereof engaging said stress relief insert.

4,555,589

LEAD WIRE RETAINER

Hiroshi Osada, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Nov. 26, 1984, Ser. No. 674,809
Int. Cl.⁴ H01B *17/58*
U.S. Cl. 174—156 **4 Claims**



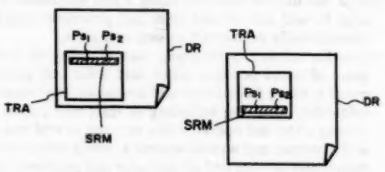
1. A lead wire retainer, comprising a pair of half rings, means for joining said half rings to complete a full ring, means for retaining a lead wire within said full ring projecting from said half rings which automatically nip the lead wire when said half rings are brought into mutual engagement, and elastic supporting means for elastically supporting said means for retaining.

4,555,590

METHOD AND APPARATUS FOR ENTERING GRAPHICS

Hajimu Kishi, Hino; Masaki Seki, Tokyo, and Kunio Tanaka, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Feb. 25, 1983, Ser. No. 469,824
Claims priority, application Japan, Feb. 27, 1982, 57-31495
Int. Cl.⁴ G08C *21/00*
U.S. Cl. 178—18 **7 Claims**



1. A method of entering graphics data using a graphic data entering apparatus including a tablet having a read-out area and a coordinate designating device for designating a plurality

of points on a figure of a drawing laid on the tablet over the read-out area, the figure having a size larger than the read-out area, said method comprising the steps of:

(a) entering graphic data on the drawing on the read-out area and the coordinates of two specified points on the figure;

(b) displacing the drawing over the tablet;

(c) entering graphic data on the displaced drawing on the read-out area and the coordinates of the displaced two specified points on the figure; and

(d) converting the coordinates of the graphics data entered before and after the drawing is displaced into graphic data for one coordinate system using the coordinates of said two specified points before and after the drawing is displaced.

4,555,591

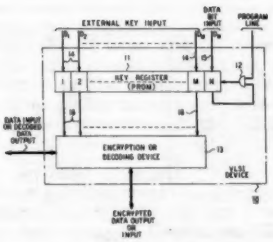
INTEGRATED CIRCUIT DEVICES FOR SECURE DATA ENCRYPTION

Randy D. Nash, Long Branch, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 7, 1982, Ser. No. 415,668

Int. Cl.⁴ A04K *1/02*

U.S. Cl. 178—22.13 **2 Claims**



1. An integrated device comprising:

an externally programmable read-only-memory register including a plurality of M+N storage locations capable of separately storing both an M-bit unique binary key word and an N-bit enable code word which is used for programming the register, the M+N bits initially including a first binary value; and

gating means responsive to the first binary value of the N-bit enable code word initially stored in the N storage locations of the register to enable the register and permit the writing of a uniquely encoded binary key word into the M storage locations of the register followed by an N-bit enable code word including a predetermined second binary value which is capable of both disabling the gating means and preventing the subsequent changing of the M+N bit values.

4,555,592

WIRELESS HANDS-FREE CONFERENCE TELEPHONE SYSTEM

Gerald J. Deinzer, Chicago, Ill., assignor to Teleconferencing Systems International, Inc., Elk Grove Village, Ill.

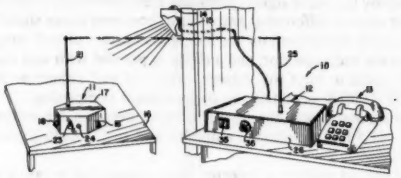
Filed May 23, 1983, Ser. No. 496,904

Int. Cl.⁴ H04Q *7/04;* **H04R** *1/02*

U.S. Cl. 179—2 E **2 Claims**

1. A wireless hands-free conference telephone system for use with a telephone, said system conprising:

a wireless microphone/transmitter circuit for receiving sounds generated over a significant distance, converting said sounds received into a first corresponding signal and radiating same from a position spatially related to the remainder of said telephone system, and including a compact housing, a plurality of distance sensitive microphones, an FM transmitter for receiving said electrical signals from said microphone and transmitting same over a pre-determined frequency, an antenna for radiating signals received from said transmitter, a portable power supply for energizing said microphone/transmitter circuit as desired and said plurality of microphones being positioned on said housing in even substantially radially outwardly extending orientation for receiving sounds signals from a pre-determined angular segment of the circumferential area surrounding said housing; each said microphone also being positioned to face generally downwardly in said housing at an acute angle to the vertical for picking up sound signals rebounding from any substantially horizontal surface on which said housing is positioned, a lowest part of said microphone being in close spatical proximity to any said horizontal surface;



a unitary control module including a receiver circuit for receiving said remotely eradiated first corresponding signal and transferring same via a first path to an output adapted for connection to said telephone;

a loudspeaker circuit for producing sound from a second corresponding signal via a second signal path from an input adapted for connection to said telephone; and

a voice switching circuit acting between said telephone and both said loudspeaker circuit and said receiver circuit on said first and second signal paths for increasing the gain in said loudspeaker circuit when said second corresponding signal is greater than said first corresponding signal, and for increasing the gain in said receiver circuit when said first corresponding signal is greater than second corresponding signal.

4,555,593

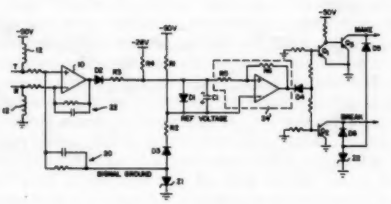
ELECTRONIC TELEPHONE RELAY

Orrin B. O'Dea, Garden Grove, Calif., assignor to Microcommunications, Inc., Santa Ana, Calif.

Filed Feb. 16, 1983, Ser. No. 467,011

Int. Cl.⁴ H04Q *1/36, 3/14*

U.S. Cl. 179—18 GD **6 Claims**



1. In an electronic circuit for replacement of an A-type relay in a step-by-step selector or connector of a telephone exchange system having: a first differential operational amplifier having

inverting and noninverting input terminals adapted to be connected to respective tip and ring conductors of a telephone line without disconnecting relay coils of said A-type relay from said conductors, one of said relay coils being connected between circuit ground and the tip conductor and the other relay coil being connected between a source of negative voltage and the ring conductor, whereby said first amplifier produces a negative output signal when a telephone switch between the tip and ring conductors is open for an ON-HOOK condition of the telephone line, and a less negative output signal when said telephone switch is closed for an OFF-HOOK condition of the telephone line; a second differential operational amplifier having inverting and noninverting input terminals, said inverting input terminal being connected to a reference voltage derived from a voltage divider, and said noninverting input terminal being connected to the output of said first differential amplifier by means comprising a coupling resistor; a capacitor connected between the output of said coupling resistor and the inverting input terminal of said second differential amplifier, thereby to couple signals from said first differential amplifier to said second differential amplifier as common mode signals for a period determined by the RC time constant of said coupling resistor and capacitor; and a diode in parallel with said capacitor poled to limit the voltage charge of said capacitor in the OFF-HOOK condition, an improvement comprising

a second diode connected in series between the output of said first differential amplifier and said coupling resistor, and

a second resistor, connected from a source of negative voltage to a junction between said capacitor and coupling resistor,

whereby ON-HOOK to OFF-HOOK transitions are presented as common mode signals to said second differential amplifier for periods controlled by the RC time constant of said coupling resistor and capacitor while OFF-HOOK to ON-HOOK transistions are presented as common mode signals to said second differential amplifier for periods independently controlled by the RC time constant of said second resistor and capacitor, thereby providing controlled RC timing of transitions at both the beginning and the end of dial pulses which are transitions from OFF HOOK to ON HOOK then back to OFF HOOK.

4,555,594

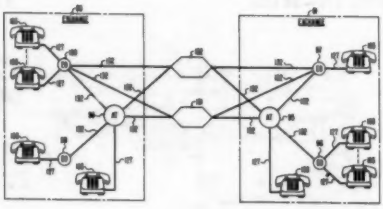
TELEPHONE INTEREXCHANGE SIGNALING PROTOCOL

Albert Friedes, East Brunswick, N.J.; Thomas V. Greene, Downers Grove, Ill.; Frederick W. Idenden, Colts Neck, N.J.; Kenneth L. Moeller, Naperville, Ill.; Robert M. Musen, Holmdel, and John F. O'Hara, Jr., Robertsville, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 3, 1983, Ser. No. 520,112

Int. Cl.[4] H04M *3/42*

U.S. Cl. 179—18 B **66 Claims**



1. A method of establishing at a first telephone switch a communication path between the first switch and a second telephone switch, for a call connected to the first telephone switch, comprising the steps of:

transmitting a first signal on a selected communication path leading from the first switch to the second switch;

receiving on the selected path a second signal responsive to the first signal;

transmitting call-characterizing information on the selected path, in response to the second signal;

receiving on the selected path a third signal acknowledging the call-characterizing information; and

connecting the call to the selected path for communication, in response to the third signal.

4,555,595

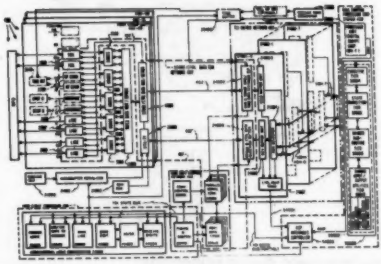
SAMPLED PORT DATA SWITCHING SYSTEM EMPLOYING INTERACTIVE PROCESSORS

Barrie Brightman, Fern Park; George Elliott, Longwood; Pedro A. Lenk, Fern Park, all of Fla.; Jayantkumar R. Shah, Munich, Fed. Rep. of Germany, and William H. Stewart, West Palm Beach, Fla., assignors to Stromberg-Carlson Corp., Lake Mary, Fla.

Division of Ser. No. 290,531, Aug. 6, 1981, abandoned, which is a continuation of Ser. No. 924,883, Jul. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 864,401, Dec. 27, 1977, abandoned. This application Nov. 8, 1982, Ser. No. 439,747

Int. Cl.[4] H04Q *3/54, 11/04*

U.S. Cl. 179—18 ES **21 Claims**



15. A telephone system comprising:

A. a plurality of ports connected to trunk lines and subscriber lines for receiving and transmitting voice signals and supervisory signals;

B. timing means for generating a first timing signal at a first frequency and a second timing signal at a lower frequency,

C. storage means connected to said ports and to said timing means for storing supervisory information representative of said supervisory signals that are transferred to and from said ports at a sampling rate dependent upon the first timing signal, and

D. port event processing means connected to said timing means and said storage means for controlling the operation of each of said ports collectively in response to the information in said storage means and the second timing signal.

4,555,596

LOUDSPEAKING TELEPHONES

Peter F. Blomley, Bishops Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 7, 1983, Ser. No. 501,791

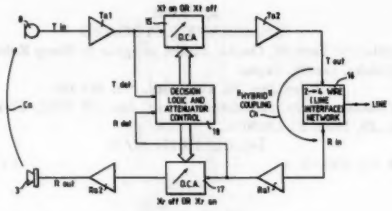
Claims priority, application United Kingdom, Jun. 10, 1982, 8216845

Int. Cl.[4] H04M *1/60, 9/10*

U.S. Cl. 179—81 B **2 Claims**

1. An electronic circuit for use in a loudspeaking of handsfree telephone comprising a transmit channel and a receive channel, said circuit including a first analogue-digital signal converter to which analogue voice frequency signals in the telephone's transmitting channel are applied and said converter

derives therefrom a succession of multi-bit digital combinations each representing the current amplitude of the voice frequency signal in that channel, a second analogue-digital signal converter to which a signal from the receiving channel is applied and which derives therefrom a succession of multi-bit digital combinations each representing the current amplitude of the voice frequency signal in the receiving channel, a comparator to which the digital combinations derived from the two channels are applied and which derives therefrom a con-



trol output which indicates which of the two channels is passing the larger signal, and control means in each of the two channels each settable respectively to disable or enable its one of the channels, the arrangement being such that if the transmitting channel signal is larger than the receiving channel signal the transmitting channel is enabled and the receiving channel is disabled, and that if the receiving channel signal is larger than the transmitting channel signal the receiving channel is enabled and the transmitting channel is disabled.

4,555,597

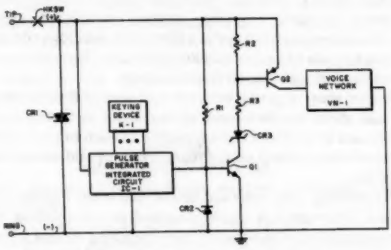
TRANSIENT RESISTANT KEY OPERATED PULSE GENERATING CALLING DEVICE CIRCUIT

Eduard F. B. Boeckmann, and Larry A. Woodworth, both of Huntsville, Ala., assignors to GTE Business Communication Systems Inc., Northlake, Ill.

Filed Dec. 5, 1983, Ser. No. 558,130

Int. Cl.[4] H04M *1/31, 1/274*

U.S. Cl. 179—90 B **4 Claims**



1. A subscriber's telephone circuit connected to a telephone line and including: a voice network; switching means operated to connect said telephone line to said voice network and, in the alternative, to disconnect said telephone line from said voice network; a pulse generator, including circuit connections to said telephone line and an output connection to said switching means; key means connected to said pulse generator manually operated to cause said pulse generator to periodically operate said switching means; and first and second unidirectional conducting means, including circuit connections to a pulse generator output means operated to prevent transients from entering said pulse generator via an output circuit connection; said first uni-directional conducting means comprising a diode connected between said pulse generator output connection and said telephone line and said second uni-directional conducting means comprising a SCHOTTKY diode included in said switching means.

4,555,598

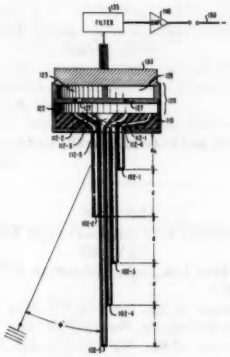
TELECONFERENCING ACOUSTIC TRANSDUCER

James L. Flanagan, Warren, and Robert A. Kubli, Whitehouse Station, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 21, 1983, Ser. No. 534,204

Int. Cl.[4] H04R *1/40*

U.S. Cl. 179—121 D **11 Claims**



1. A directional acoustic transducer comprising:

a plurality of acoustic paths each having first and second ends, each path second end terminating in the atmosphere;

an acoustic cavity;

an electroacoustic device attached to said acoustic cavity; and

means between the acoustic path first ends and said acoustic cavity for coupling said acoustic paths to said acoustic cavity;

said coupling means comprising acoustical means adapted to produce a substantially cone shaped directional response pattern having an apex at the acoustic path second ends.

4,555,599

SIGNAL TRANSMISSION DEVICES

Francis C. Hackett-Jones, Kent, England, and Frederick H. Kiko, Aurora, Colo., assignors to Telspec Limited, Rochester, England

Filed Mar. 9, 1984, Ser. No. 588,006

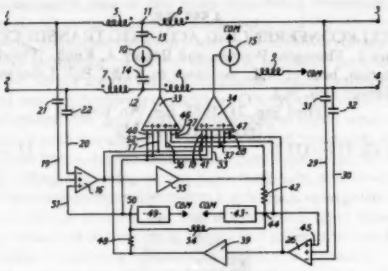
Claims priority, application United Kingdom, Mar. 18, 1983, 8307628

Int. Cl.[4] H04B *3/36*

U.S. Cl. 179—170 R **7 Claims**

1. A signal transmission device comprising a signal path extending between respective terminals of an input and an output port of the device, a controllable, substantially load independent current source shunting said signal path at a point intermediate said input and output ports, impedance means connected in each series circuit including the terminals of a respective port of the device and the shunt path provided by said current source for presenting at each port an impedance which is high in relation to that of a signal source to be coupled to said input port or of a signal load to be coupled to said output port, as the case may be, said current source being responsive to a voltage signal applied at the terminals of said input port to provide a corresponding magnitude of output current, and means being provided for determining the relative proportions of the current from said current source which pass through the respective impedance means in the input and

output circuits of the device, thereby to determine the virtual impedances of the device presented at said input and output



ports respectively and to determine the signal gain provided by said device.

4,555,600

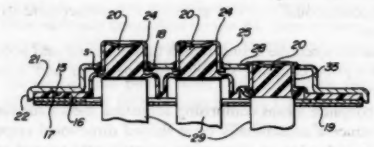
VANDAL-RESISTANT SHIELD FOR TELEPHONE KEYPAD

Milton Morse, Fort Lee, N.J., assignor to APM Corporation, Englewood, N.J.

Continuation-in-part of Ser. No. 381,905, May 25, 1982, and a continuation-in-part of Ser. No. 299,509, Sep. 4, 1981, and a continuation-in-part of Ser. No. 286,063, Jul. 23, 1981, and a continuation-in-part of Ser. No. 261,647, May 7, 1981, and a continuation-in-part of Ser. No. 236,757, Feb. 23, 1981. This application Oct. 21, 1983, Ser. No. 544,391

Int. Cl.⁴ H01H *13/70*

U.S. Cl. 179—184 **23 Claims**



1. In combination with a keypad comprising:

a rigid support plate having a front face and formed with an array of throughgoing apertures;

respective push-buttons projecting at the apertures through the plate past the front face thereof;

a continuous flexible membrane overlying the front face and formed at each of the push-buttons with a relatively thick projecting portion in front of the respective pushbuttons, whereby the membrane seals the apertures around the buttons while allowing same to be depressed via the thick portions; and

means urging the pushbuttons and the overlying thick portions forward from the front face;

a shield assembly comprising:

a rigid shield plate formed with an array of throughgoing apertures aligned with and generally identical to those of the support plate and having a rear face confronting the front face of the support plate and an opposite front face, the thick projecting portions of the membrane projecting forward through the apertures of the shield plate past the front face thereof;

means for securing the shield plate in front of the membrane with the apertures aligned; and

respective rigid caps fitted over the thickened portions, projecting forward through the shield-plate apertures, and each having an outwardly projecting flange extending generally parallel to and lying between the plates and of greater size than the respective shield-plate aperture, the means urging the respective flanges forward against the rear face of the shield plate.

4,555,601

MEMBRANE KEYBOARD

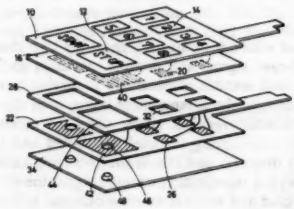
Toshimichi Taguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 26, 1983, Ser. No. 461,148

Claims priority, application Japan, Jan. 29, 1982, 57-13679; Jan. 29, 1982, 57-13680

Int. Cl.⁴ H01H *13/70*

U.S. Cl. 200—5 A **2 Claims**



1. A membrane keyboard comprising:

a first flexible sheet having key pad labels formed thereon, said key pad labels including at least one larger size key pad label and at least one smaller size key pad label;

a second flexible sheet disposed below said first flexible sheet, said second flexible sheet carrying conductor electrodes formed on the rear surface thereof at positions corresponding to each of said key pad labels formed on said first flexible sheet;

a sheet member disposed below said second flexible sheet, said sheet member carrying counter conductor electrodes formed on the front surface thereof at positions corresponding to each of said conductor electrodes formed on the rear surface of said second flexible sheet;

a spacer sheet disposed between said second flexible sheet and said sheet member, said spacer sheet including openings formed at positions corresponding to each of said conductor electrodes formed on the rear surface of said second flexible sheet;

a reinforcing plate disposed below said sheet member; and

space determination means disposed in the opening of said spacer sheet, said opening corresponding to said larger size key pad label, thereby ensuring electrical separation of the conductor electrode and the counter conductor electrode formed at said larger size key pad label, said space determination means comprising:

an aperture formed in said sheet member at a position about the center of said counter conductor electrode which corresponds to said larger size key pad label; and

a protrusion formed on said reinforcing plate at a position corresponding to said aperture formed in said sheet member, wherein

said protrusion extends through said aperture formed in said sheet member and said opening formed in said second flexible sheet, and confronts said conductor electrode formed on said first flexible sheet, said conductor electrode corresponding to said larger size key pad label.

4,555,602

DRAW OUT SWITCHGEAR AND OPERATING MECHANISM

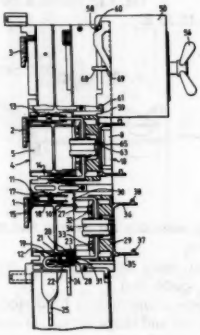
Thomas W. Mennell, Scarborough, England, assignor to Y.S. Securities Limited, England

Filed Apr. 23, 1984, Ser. No. 602,987

Claims priority, application United Kingdom, Apr. 22, 1983, 8311063; Aug. 17, 1983, 8322119

Int. Cl.[4] H01H *9/20*

U.S. Cl. 200—50 AA **13 Claims**



1. An electrical assembly comprising a fixed casing with an opening into the casing; a pair of fixed contacts spaced apart within the casing and set back from the opening into the casing; a structure forming a contact carrier carrying a pair of movable contacts thereon; cooperating guide means on the casing and the contact carrier for guiding the contact carrier to move within the casing along a rectilinear path between a first position adjacent to the opening, in which position the movable contacts are spaced from the fixed contacts, and a second position in which the movable contacts engage the fixed contacts to close a circuit therebetween; a manually portable drive unit for mechanically driving the carrier between the positions, the drive unit being a self-contained mechanism that is mountable on the casing to lie outside thereof and that is demountable from the casing; the drive unit comprising a drive housing; means for releasably locking the drive housing to the fixed casing against relative movement thereto when the drive unit is mounted on the casing; a drive member movable relative to the drive housing and means for detachably coupling the drive member to the contact carrier when the drive unit is mounted on the casing.

4,555,603

GROUNDING SWITCH

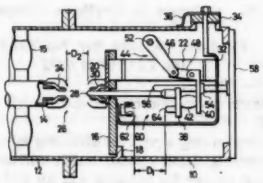
Takanobu Aoyama, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,403

Claims priority, application Japan, Jul. 26, 1982, 57-130081

Int. Cl.[4] H01H *33/16*

U.S. Cl. 200—144 AP **15 Claims**



1. A grounding switch comprising:

a resistance contact means having a fixed contact means connected to a main power circuit conductor and a movable contact means;

a resistor means being grounded at one end and being connected to the movable contact means at the other end; and

short circuiting contact means having a grounded fixed contact means and a movable contact means connected to the movable contact means of said resistance contact means, said short circuiting contact means being arranged so as to extend in parallel with said resistance contact means in a direction of movement of the movable contact means of said resistance contact means.

4,555,604

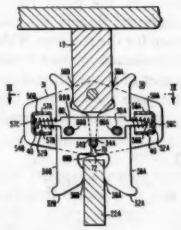
CIRCUIT BREAKER HAVING IMPROVED STAB ASSEMBLY

Alfred E. Maier, and Louis N. Ricci, both of Chippewa Township, Beaver County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 6, 1983, Ser. No. 558,723

Int. Cl.[4] H01H *1/50*

U.S. Cl. 200—255 **10 Claims**



1. An electric circuit breaker for connection to one or more current carrying members, comprising:

a stationary contact;

a movable contact operable between open and closed positions with respect to the stationary contact;

movement effecting means for effecting relative movement of the movable contact between the open and closed positions;

support means secured to the stationary contact and movable contact for maintaining the position of the stationary and movable contact with respect to one another when the movable contact is in the open or closed position;

stab means for detachably and electrically interconnecting a portion of a preselected contact selected from the stationary contact or the movable contact to a portion of at least one of the current carrying members by the insertion therein of said portion of said preselected contact and said portion of said current carrying member, the stab means comprising:

a plurality of pairs of opposed, relatively movable, electrically conductive fingers, each finger having two relatively parallel faces, an opposed face and an opposite face, the opposed faces each having a contact surface placed in contact with the portions of the preselected contact and the current carrying member when each is inserted into the stab means between the opposed faces of the opposed fingers thereof;

housing means for holding the pairs of opposed fingers in a spaced relationship with respect to the inserted portions of the preselected contact and the current carrying member and aligning adjacent fingers substantially parallel with respect to one another, the housing comprising:

a pair of axially aligned substantially parallel end housings, each end housing having two relatively parallel faces, an opposed face and an opposite face, and disposed opposite one another extending across the opposite faces of the

opposed fingers, the opposed faces of the end housings having a substantially U-shaped channel therein, the channel positioned proximate the opposite faces of the opposed fingers, the ends of the channel walls limiting the outward axial and arcuate motion of the fingers with respect to the inserted portions of the preselected contact and the current carrying member;

a pair of substantially parallel support members for holding the end housings in a spaced relationship, each support member having a pair of openings intermediate the end housings with an opening proximate each end housing, corresponding openings in the support members being substantially aligned with respect to each other, a pivot hole, and a projection extending therefrom toward the current carrying member forming an insertion stop intermediate the opposed fingers abutting the current carrying member when inserted into the stab means to prevent the overinsertion thereof;

a pivot rod connected to the housing means and positioned intermediate the inserted portion of the preselected contact, the insertion stop and the opposed fingers with the pivot rod extending across the space therebetween, ends of the pivots rod being inserted in the pivot holes of the support members, the pivot rod stopping the axial motion of the opposed fingers toward one another and acting as a fulcrum for the rotation of the fingers when the portion of the preselected contact is inserted into the stab means, the diameter of the pivot rod controlling the minimum spacing between the opposed fingers upon disconnection of the current carrying member from the stab means; and

a pair of assembly pairs;

a plurality of support shims, a support shim intermediate the fingers in each pair of adjacent fingers and a corresponding axially aligned opposing pairs of fingers with the ends thereof extending beyond the opposite faces of the opposed pairs of fingers into the U-shaped channels of the end housings, each support shim having a pair of openings, one opening in alignment with each of the openings in the support members that are proximate the end housings;

a plurality of spacing shims, a spacing shim intermediate the adjacent pairs of fingers and the corresponding axially aligned opposing pairs of fingers, each spacing shim having a pair of openings, one opening aligning with each of the openings in the support members;

means for detachably fastening the support members of the housing means to the preselected contact when inserted into the stab means thereby assuring disconnection of the stab means from the current carrying member whenever the circuit breaker is disconnected therefrom;

biasing means disposed about the opposite faces of the opposed fingers for axially urging the opposed fingers toward each other thereby increasing the contact pressure of the opposed fingers upon the inserted portions of the preselected contact and the current carrying member, the biasing means comprising a plurality of compression springs, one spring disposed about each end of each support shim, the springs being compressed between the base of the U-shaped channels in the end housings and the opposite faces of the fingers adjacent each support shim, the fully compressed length of each spring being less than the depth of the U-shaped channel thereby avoiding the overcompression thereof caused by the outward axial or arcuate motion of the fingers with the ends of the support shims preventing lateral motion of the springs with respect to the opposite faces of the opposed fingers; and

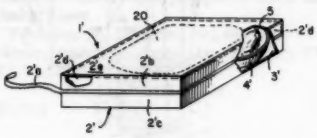
each finger having a slot, the slots of the adjacent fingers aligning with the openings in the adjacent support shims and spacing shims so that the assembly pins can be inserted therethrough for assembling the stab means, the slot in each finger allowing arcuate and axial motion of the finger with respect to the inserted portions of the preselected contact and the current carrying member with the support shims and spacing shims allowing for the independent arcuate and axial motion of each finger.

4,555,605

PACKAGE ASSEMBLY AND METHOD FOR STORING AND MICROWAVE HEATING OF FOOD

Richard K. Brown, Appleton, and Oscar E. Selferth, Madison, both of Wis., assignors to James River-Norwalk, Inc., Norwalk, Conn.

Filed Aug. 2, 1984, Ser. No. 637,057
Int. Cl.[4] H05B 6/64
U.S. Cl. 219—10.55 E **20 Claims**



1. A package assembly for storing and microwave heating of food comprising

(a) a package body defining, in an assembled condition, a receiving space; and

(b) a disposable combination food storage tray and heating stand of a size and shape which, in an assembled condition, is fully receivable within the receiving space of the package body;

wherein the combination storage tray and heating stand has tray means forming a food storage space of a size and shape within which a predetermined quantity of food may be stored and when the combination storage tray and heating stand is received within said receiving space of the package body, said food storage space being bounded by a support wall upon which said predetermined quantity of food is positionable and at least one perimetric wall that projects upwardly from said support wall for laterally enclosing food positioned thereon; wherein said at least one perimetric wall is sized and shaped so as to coact with said support wall for converting said food storage space into an enclosed air space when said combination storage tray and heating stand is placed on the floor of a microwave oven in an inverted heating stand condition; wherein the at least one perimetric wall and support wall are of sufficient strength to support said predetermined quantity of food upon said support wall when said combination storage tray and heating stand is in said inverted heating stand condition; and wherein said at least one perimetric wall and support wall are formed of a material that is transparent to microwave energy; and wherein a microwave interactive layer formed of a material capable of converting microwave energy into heat is disposed in association with said support wall for heating said predetermined quantity of food when it is supported upon said support wall in said inverted heating stand condition.

4,555,606

AIR FLOW SYSTEM FOR COMMON CAVITY OVEN

Calvin J. Thomas, Orefield, and James E. Hurley, Allentown, both of Pa., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 19, 1984, Ser. No. 632,517
Int. Cl.[4] H05B 6/72
U.S. Cl. 219—10.55 R **17 Claims**

1. A common cavity microwave and electric self-clean oven, comprising:

an oven cavity having a port for directing air into said cavity;

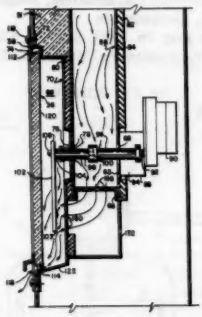
an electric heating element positioned in said cavity for providing thermal energy for cooking and for self-cleaning;

a magnetron for energizing said cavity with microwave energy for cooking;

a blower coupled to said port wherein at least a portion of air

forced from said blower is directed through said port into said cavity;

means for controlling said heating element, said magnetron, and said blower, wherein said controlling means activates said blower when said magnetron is activated to remove moisture from said cavity; and



wherein said controlling means also activates said blower when said heating element is activated in a self-cleaning mode to resist hot air from said cavity flowing outwardly through said port.

4,555,607

PROCESS FOR INSTALLATION AND REMOVAL OF GLASS PANE FROM A FRAME

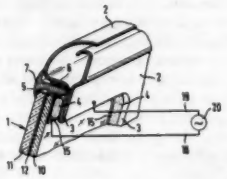
Paul Roentgen, Talweg 7, D-5106 Roetgen/Rott; Helmut Krumm, Lohmühlenstrasse 2, D-5100 Aachen; Gottfried Krasborn, Bismarckstrasse 12, D-5100 Aachen, and Günter Lenzen, Teichwinkel 14, D-5100 Aachen, all of Fed. Rep. of Germany

Continuation of Ser. No. 384,939, Jun. 4, 1982, abandoned. This application Jun. 1, 1984, Ser. No. 616,026

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124138

Int. Cl.⁴ H05B *6/64*

U.S. Cl. 219—10.57 **11 Claims**



1. A process for attaching a glass pane to a frame which comprises the steps of:

(a) depositing a conductive material in strip form on the marginal edge of said glass pane;

(b) attaching the conductive material onto the glass;

(c) depositing a layer of thermoplastic adhesive between the glass pane and the frame;

(d) connecting a source of electric power to the conductive strip; and

(e) passing electric current through the conductive strip to heat the adhesive to its deformation temperature to bond the glass to the frame.

4,555,608

INVERTER DEVICE FOR INDUCTION HEATING

Takumi Mizukawa, Neyagawa; Yoshio Ogino, Takatsuki; Hideki Ohmori, Kawanishi, and Taketoshi Sato, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

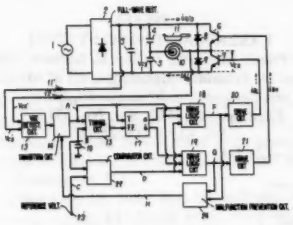
PCT No. PCT/JP82/00426, § 371 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO83/01721, PCT Pub. Date May 11, 1983

PCT Filed Nov. 2, 1982, Ser. No. 522,373

Claims priority, application Japan, Nov. 4, 1981, 56-176871

Int. Cl.⁴ H05B *6/06, 6/64*

U.S. Cl. 219—10.77 **2 Claims**



1. An inverter device for induction heating, comprising a bridge inverter having a pair of series-connected switching elements connected to a DC power source and having an output obtained from a junction between said switching elements, a circuit for detecting the turn-off of said switching elements comprising a voltage comparator having one input terminal connected to said junction and another input terminal connected to said DC power source wherein said turn-off is detected when the voltages at said one and another input terminals become equal, and a timing circuit and a flip-flop circuit which are connected to an output of said turn-off detection circuit, the arrangement being such that after the turn-off of one of said switching elements has been detected, the other switching element is driven.

4,555,609

ARC WORKING TORCHES

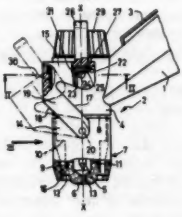
Gérard Marhic, Cergy; Didier Schaff, Auvers-sur-Oise, and Francis Remy, Montigny-les-Cormeilles, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Sep. 26, 1983, Ser. No. 535,881

Claims priority, application France, Oct. 1, 1982, 82 16511

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219—121 PC **8 Claims**



1. An arc working torch comprising, in combination:

an electrode;

a head element surrounding the electrode and having a shoulder and a free end;

a removable protective cowling having a skirt elemnent

surrounding the free end of the head element and axially positioned by said shoulder;

a tilting stirrup pivotally supported by one of said elements for movement between an open position and a closed position;

clipping means for releasably connecting the stirrup to the other of said elements to thereby secure said cowling to said head element in the closed position of said stirrup;

actuating means for supplying electrical energy to said electrode; and

a safety circuit connected to said actuating means for interrupting the supply of electrical energy, the safety circuit including a pair of terminals carried by said other element.

4,555,610

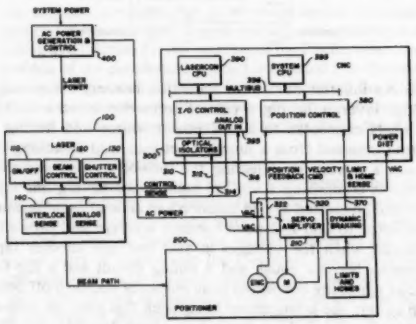
LASER MACHINING SYSTEM

Michael D. Polad, Mendota; LeRoy E. Gerlach, Bloomington, and Robert H. Schmidt, Minnetonka, all of Minn., assignors to Data Card Corporation, Minnetonka, Minn.

Filed Sep. 13, 1983, Ser. No. 531,777

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LA **19 Claims**



1. A machining system utilizing a laser beam for machining a stationary workpiece, comprising:

a frame constructed and arranged for positioning adjacent the stationary workpiece;

first optical path means oriented along a first axis relative to the frame and constructed and arranged for extension and retraction along the axis thereof in response to a first command signal, the first optical path means operatively coupled to the laser for receiving the beam at one end thereof and for delivering a collimated laser beam at an output end thereof;

second optical path means oriented along a second axis relative to the frame and constructed and arranged for extension and retraction along the second axis in response to a second command signal, the second optical path means operatively coupled to the output end of the first optical path means for receiving the beam therefrom at one end and for delivering a collimated laser beam at an output end thereof;

third optical path means oriented along a third axis relative to the frame and constructed and arranged for extension and retraction along the third axis in response to a third command signal, the third optical path means operatively coupled to the output end of the second optical path means for receiving the beam therefrom at one end and for delivering a collimated laser beam from an output end thereof to a workpiece; and

control logic means for generating first, second and third command signals to move the laser beam across the workpiece in accordance with a machining program, and including laser control means for generating command signals for varying the intensity of the laser beam in accordance with the machine program to match the machining characteristics of the laser beam to the stored characteristics of the workpiece.

4,555,611

METHOD AND APPARATUS FOR UNIFORMLY HEATING ARTICLES IN A VACUUM CONTAINER

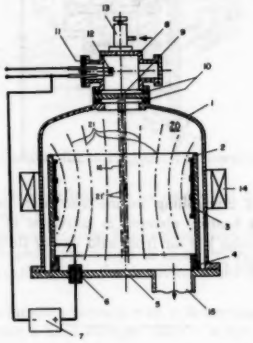
Eberhard Moll, Triesen, Liechtenstein, assignor to Balzers Aktiengesellschaft, Liechtenstein

Filed Aug. 26, 1983, Ser. No. 526,526

Claims priority, application Switzerland, Sep. 10, 1982, 5389/82

Int. Cl.⁴ B23K *9/00*

U.S. Cl. 219—121 **7 Claims**



1. A method of uniformly heating articles in a vacuum container comprising: supporting the articles on an anode; bombarding the articles with electrons from a magnetically beamed low voltage arc discharge sustained between the anode, which is provided in the container, and a hot cathode which is provided in a cathode chamber communicating with the container through an aperture; and during the bombarding operation maintaining a magnetic field such that lines of magnetic force which extend through the aperture between the cathode chamber and the container do not extend through and do not intersect the articles to be heated.

4. A device for heating articles in a vacuum, comprising a container having an interior chamber, means defining a hot cathode chamber connected to said interior chamber, means for directing a plasma flame past the articles to be heated, a support for the articles to be heated positioned in the interior of said chamber and defining an anode, there being an aperture defined between said hot cathode chamber and the interior of said container means connected between said anode and said cathode for electrically energizing said anode and cathode to generate a low voltage arc discharge for bombarding the articles, and means for generating a magnetic field having lines of force favoring the generation of the plasma and extending through the aperture in a direction so as to intersect any surfaces of the articles.

4,555,612

PLASMA JET CLEANING APPARATUS AND METHOD

Michael F. Collins, Scotia, and Francis D. Lordi, Rotterdam Junction, both of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,668

Int. Cl.⁴ B23K *9/00*

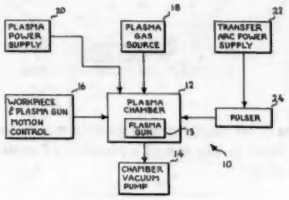
U.S. Cl. 219—121 P **16 Claims**

1. Apparatus for plasma jet cleaning of a workpiece comprising:

means for producing a plasma jet impingable on a workpiece;

means for producing a negative voltage on said workpiece effective for maintaining a cathode current between said workpiece and said means for producing a plasma jet; and

means for cyclically varying said cathode current at a repetition frequency between a first current value which is effective to perform plasma jet cleaning of said workpiece



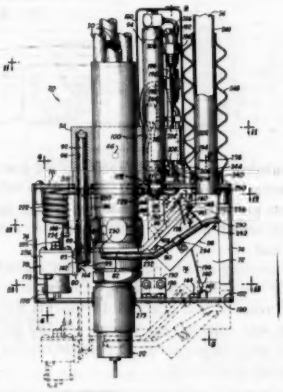
and a second, lower, current value in the same direction as said first current value, without an intervening current value of zero which is effective to enhance movement of said plasma jet over a surface of said workpiece whereby improved cleaning with reduced probability of workpiece surface damage is attained.

4,555,613

IMAGE SENSING AND WELDING ARRANGEMENT FOR MANIPULATOR WELDING APPARATUS

Burt H. Shulman, Salt Point, N.Y., assignor to Unimation, Inc., Danbury, Conn.

Filed Oct. 17, 1984, Ser. No. 661,587
Int. Cl.[4] B23K 9/00
U.S. Cl. 219—124.34 **24 Claims**



1. An image sensing arrangement for a manipulator arm having a plurality of arm sections interconnected by rotary joints and a hand rotatably connected to the end of the outermost one of said arm sections,

a welding torch connected to said hand;

a sensing assembly carried by said hand and movable relative to said welding torch, said assembly comprising a projection source and an optical sensing unit including an objective lens;

a camera mounted on said outermost arm section;

a fibre optic cable connected between said objective lens and said camera to permit rotation of said hand relative to said outermost arm section and movement of said assembly relative to said welding torch;

means for normally positioning said assembly within a housing carried by said hand; and

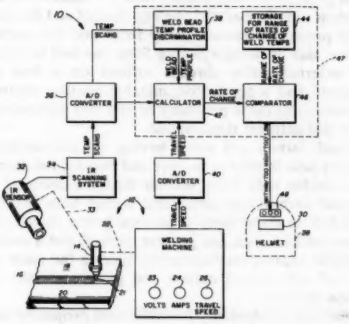
means for moving said assembly along a line parallel to the axis of said welding torch to a sensing position outside said housing.

4,555,614

WELD METAL COOLING RATE INDICATOR SYSTEM

Richard A. Morris, Severna Park; William E. Lukens, Annapolis, and Charles A. Zanis, Bowie, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 24, 1984, Ser. No. 685,943
Int. Cl.[4] B23K 9/10
U.S. Cl. 219—130.01 **8 Claims**



1. A weld metal cooling rate indication system for a welding machine wherein the welding machine has a torch which is capable of producing a weld bead and has a speed sensor which senses the speed at which the torch travels as selected by an operator, the indication system comprising:

measns for continuously sensing a temperature versus distance profile curve along the weld bead, said profile curve including a predetermined weld temperature;

means responsive to the temperature versus distance profile curve sensing means and the speed sensor for calculating and producing a signal which represents rate of change of weld temperature at said predetermined weld temperature along the weld bead;

means for producing signals which are representative of a range of acceptable rates of change of weld temperatures at said predetermined weld temperature;

means responsive to the calculating means and the producing means for comparing the rate of change of temperature signal with a range of acceptable rates of change of weld temperature signals and producing signals which represent whether the rate of change of temperature is within, above, or below the said range; and

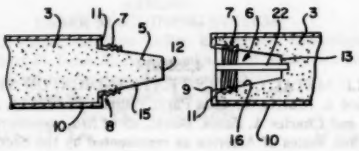
means responsive to the comparing means for indicating whether the rate of change of weld temperature is within, above, or below the range of acceptable rates of change of weld temperatures.

4,555,615

CARBON ROD ASSEMBLY FOR ARC GOUGING AND BLASTING OF METALLIC ARTICLE

Haruo Yasuda, Ohgaki; Kunihiko Yoshida, Motosu; Yasuro Iwai, Ohgaki, and Takayuki Mizutani, Yoro, all of Japan, assignors to Ibigawa Electric Industry Company, Ltd., Japan

Continuation of Ser. No. 352,758, Feb. 26, 1982, Pat. No. 4,492,850. This application Aug. 6, 1984, Ser. No. 637,784
Claims priority, application Japan, Mar. 3, 1981, 56-29348
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.
Int. Cl.⁴ B23K *9/24*
U.S. Cl. 219—145.21 **6 Claims**



1. A carbon rod assembly for arc gouging and blasting of a metallic article, comprising:

a first carbon rod piece having a substantially frusto-conical axial projection formed at one end thereof, the diameter of said projection being smaller than the diameter of said first carbon rod piece at said one end thereof and decreasing as said projection extends away from said first carbon rod piece, said projection having from one-half to three turns of external screw threads formed on a foot portion thereof, and a conductive metallic coating continuously covering the outer periphery of said first carbon rod piece and said external threads; and

a second carbon rod piece having a frusto-conical axial socket hole formed at an open end thereof, the diameter of said socket hole being smaller than the diameter of said second carbon rod piece, said socket hole having from one-half to three turns of internal screw threads formed adjacent said open end portion thereof, and a conductive metallic coating continuously covering the outer periphery of said second carbon rod piece and said internal screw threads;

wherein said substantially frusto-conical projection and said frusto-conical axial socket hole have the same taper, the axial length of said projection being smaller than the axial depth of said socket hole, wherein said socket hole of said second carbon rod piece is bisected by an axial slit formed at said open end of said second carbon rod piece, whereby said first and second carbon rod pieces are adapted to be firmly joined together by inserting said projection into said socket hole and rotating said carbon rod pices relative to each other.

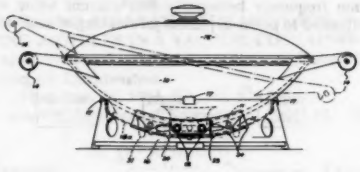
4,555,616

ELECTRICALLY HEATED WOK

William J. O'Brien, Vaucluse, Australia, assignor to Breville Holdings Pyt. Limited, New South Wales, Australia

Filed Aug. 28, 1984, Ser. No. 645,171
Claims priority, application Australia, Aug. 31, 1983, PG1159
Int. Cl.⁴ F27D *11/02*
U.S. Cl. 219—432 **7 Claims**

1. An electrically heated wok comprising a bowl of rigid heat-conductive material having a wall the inner surface of which is a smooth part-spherical surface and the outer surface of which is smooth and part-spherical except in its central area, the wall being of substantial thickness, an electrical heating element embedded in the underside of the bowl and electrically insulated therefrom, an electrical connector means for enabling an electrical connection to be made to said heating element, an annular supporting skirt of rigid material surrounding said heating element and making sliding contact with the smooth portion of the undersurface of the bowl, guiding means for guiding movement of the bowl in relation to the skirt,



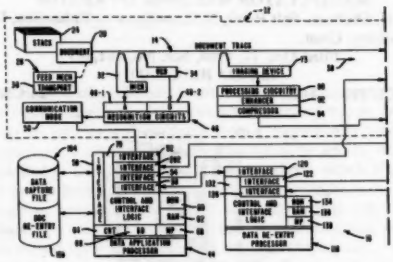
means on the bowl engaging said guiding means and means for locking the bowl in any one of a plurality of positions in relation to said skirt.

4,555,617

CONCURRENT, IMAGE-BASED, REJECT-RE-ENTRY REPAIR SYSTEM AND METHOD

Ralf M. Brooks, and Daniel A. Lepic, both of Waterloo, Canada, assignors to NCR Canada Ltd.-NCR Canada Ltee, Mississauga, Canada

Filed Dec. 23, 1982, Ser. No. 452,524
Int. Cl.⁴ G06F *15/30*
U.S. Cl. 235—379 **14 Claims**



1. A document re-entry and repair system comprising:

a reader/sorter having a reject pocket into which rejected documents are fed, said rejected documents meaning those documents which have the entire monetary amount missing thereon; and

means for encoding data on said rejected documents, with said means for encoding data being connected to said reject pocket to receive said rejected documents from said reject pocket as said rejected documents are fed into said reject pocket by said reader/sorter to provide on-line encoding of said rejected documents.

4,555,618

METHOD AND MEANS FOR COLLECTING HIGHWAY TOLLS

Bernard N. Riskin, Lambertville, N.J., assignor to R L Associates, Yardley, Pa.

Filed Jun. 2, 1983, Ser. No. 500,584
Int. Cl.⁴ G07B *15/02*
U.S. Cl. 235—384 **19 Claims**

1. The method of extending credit to, and thereafter billing, individual customers of a credit grantor for fees incurred by operation of a vehicle indentified with the customer past any one of a plurality of given scanning locations, that comprises the steps of:

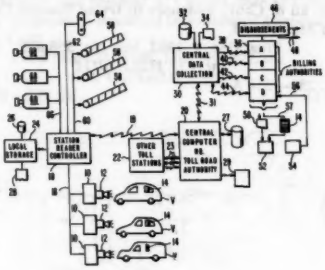
(a) providing each customer with a machine-readable bar code element that is issued by the credit grantor, bears an

account identification, and is adapted to be attached to an exteriorly visible surface of the customer's vehicle;

(b) machine-reading said element while the vehicle is in movement past said location;

(c) transmitting the machine-read data from said locations through a computer system common to all of said locations, to a central billing authority of the credit grantor; and

(d) transferring said data, at the location of the billing authority, to billings addressed to the customers in the amounts chargeable for operation of their vehicles past said point.

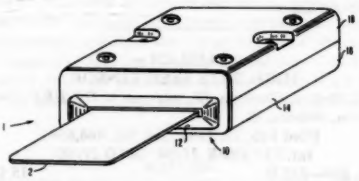


4,555,619

DRIVER KEY CAR IDENTIFYING SYSTEM

Eric G. Anderson, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 496,043
Int. Cl.⁴ G06K *19/06*
U.S. Cl. 235—492 **15 Claims**



1. A key card system comprising:

(a) a key card receiver having a jack with plural terminals including power-out terminals, power-in terminals and data terminals;

(b) a power source connected to the power-out terminal;

(c) a key card having first and second sides, power-in contacts and power-out contacts located on both sides, first connection means connecting the power-in contacts with the power-out contacts including means to connect them through a body of the card, a plurality of data contacts located on opposite sides of the card, a plurality of conductors located on opposite sides of the card and connecting the power-in contacts to the data contacts, the conductors on one side of the card being alternately looped, second connection means extending through the body of the card connecting distal ends of the looped conductors to conductors on an opposite side of the card in opposite sequential order thereby enabling the cord to be inserted into the receiver with either side up;

(d) means for interrupting selected conductors for producing a binary code of shorted and interrupted conductors on the data contacts;

(e) converting means connected to the data terminals for converting binary shorted or open data from the key card concurrently received on the data terminals to sequential data; and,

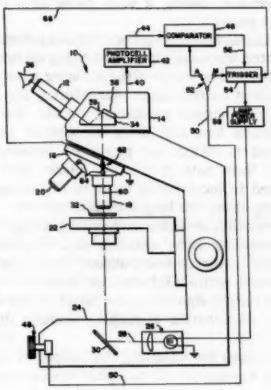
(f) signal output means connected to the converting means for carrying the sequential data to a remote location.

4,555,620

AUTOMATIC ILLUMINATION CONTROL FOR MULTI-OBJECTIVE OPTICAL INSTRUMENTS SUCH AS MICROSCOPES

William D. Bridson, Ontario, and Edward N. Esmay, Webster, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 11, 1983, Ser. No. 457,301
Int. Cl.⁴ G01J *1/32*
U.S. Cl. 250—205 **7 Claims**



1. In an optical instrument having an optical axis, a plurality of objectives selectively positionable along said optical axis, and means, including an illuminator, for producing a preselected light level at a receptor plane positioned along said axis, apparatus for automatically maintaining said preselected light level at said receptor plane, regardless of which of said objectives is positioned along said optical axis, said apparatus comprising:

a photocell mounted relative to said optical axis to detect at least a portion of said preselected light level at said receptor plane, said photocell producing a signal proportional to the amount of light detected, said signal changing in response to a change in said preselected light level;

monitoring means for receiving and comparing said photocell signal with a preselected reference signal and producing an output comparison signal, said comparison signal changing in response to a change in said photocell signal;

trigger means receiving said comparison signal and sending an output signal proportional thereto to said illuminator, said output signal changing in response to a change in said comparison signal to thereby change the output of said illuminator to thereby maintain a preselected light level at said receptor plane; and

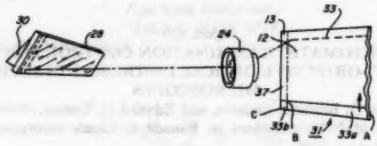
means responsive to a change from one objective to another, said means being electrically connected to said trigger means to overide and reduce the preselected light level to a further predetermined level of light when any objective is not aligned with said optical axis.

4,555,621

ILLUMINATION CONTROL SYSTEM UTILIZING AN INTEGRATING FEEDBACK DETECTOR

Wayne A. Buchar, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1983, Ser. No. 507,614
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **4 Claims**



1. A document scanning system comprising:

an illumination source adapted to provide incremental line illumination during a scan cycle of a document at an object plane;

a projection lens for projecting incremental line images reflected from said document along an optical path onto a photosensitive image plane forming a latent image of the document on the image plane during the scan cycle;

at least one mirror positioned on the image side of said projection lens and along the optical path, said mirror adapted to reflect the projected incrementally scanned image lines onto said image plane, said mirror further adapted to incorporate an optically transparent area extending along the height of said mirror;

an illumination detector comprising a light guide member for coupling light entering said transparent area and adapted to direct said coupled light onto a photosensor contained within said member, said photosensor generating an output signal representative of the integrated level of the illumination impinging thereon during said scan cycle; and

control means for adjusting the output of said illumination source in response to said photosensor output signal.

4,555,622

PHOTODETECTOR HAVING SEMI-INSULATING MATERIAL AND A CONTOURED, SUBSTANTIALLY PERIODIC SURFACE

Alastair M. Glass, Rumson; Anthony M. Johnson, New Brunswick, and Paul F. Liao, Fair Haven, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1982, Ser. No. 445,460
Int. Cl.[4] H01L *31/00*
U.S. Cl. 250—211 J **26 Claims**

1. A photodetector, comprising:

a body which includes semi-insulating material and which includes means for detecting a change in said body when said body is exposed to electromagnetic radiation, characterized in that

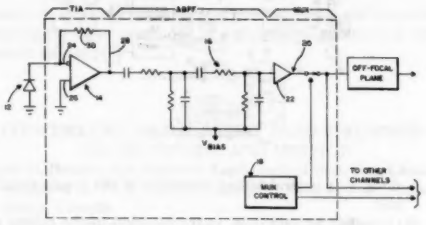
said body also includes a contoured surface which is substantially periodic and includes prominences, the average spacing, A, between, and the composition of, said prominences being chosen to couple at least a portion of said radiation into said body in the form of a propagating electromagnetic wave traveling through said body adjacent said contoured surface and/or localized plasma resonances within said prominences.

4,555,623

PRE-AMPLIFIER IN FOCAL PLANE DETECTOR ARRAY

Walter F. Bridgewater, Santa Clara; Robert E. De Caro, Hermosa Beach; Roger Larson, Fullerton, and Llewellyn E. Wall, Irvine, all of Calif., assignors to Irvine Sensors Corporation, Costa Mesa, Calif.

Filed Dec. 5, 1983, Ser. No. 558,099
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 A **11 Claims**



1. A focal plane optical-electronics systems comprising:

a plurality of densely packed photo-detectors, each electrically connected to a separate circuit;

a single-stage pre-amplifier in each photo-detector circuit having its input connected to its photo-detector and including a matched differential pair of MOSFET transistors;

means in each photo-detector circuit for limiting the current available to the pre-amplifier to cause it to operate in the weak-inversion mode; and

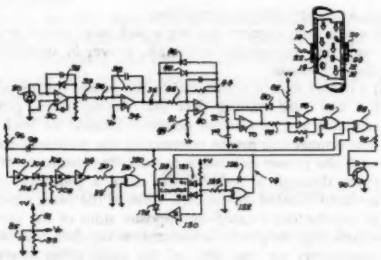
means in each photo-detector circuit for providing feedback resistance between the pre-amplifier output and its photo-detector input.

4,555,624

HIGH RATE SEED SENSOR

David E. Steffen, Chatham, Ill., assignor to DICKEY-john Corporation, Auburn, Ill.

Filed Feb. 22, 1983, Ser. No. 468,858
Int. Cl.[4] H03K *21/04*; G01D *21/00*
U.S. Cl. 250—223 R **15 Claims**



1. An improved circuit for a seed sensor which includes a light source and light responsive means respectively positioned along a path of travel of seeds for producing a momentary change in signal level from the light responsive means in response to a momentary change of level of light incident thereupon from said light source due to the passage of one or more seeds therebetween, said circuit comprising: a switching circuit responsive to said change in signal level from said light responsive means for producing an output signal including a discrete

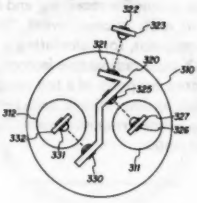
pulse signal in response to the initiation of said change in signal level and thereafter a further discrete pulse signal in response to each change in the direction of said change in signal level.

4,555,625

PRECISION DRUM ENCODER

Donald E. Mosier, and Michael R. Cascini, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 21, 1983, Ser. No. 477,202
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **11 Claims**



1. A position encoder comprising in combination:
a. a plurality of light sensors rigidly attached to a frame member;
b. a plurality of light sources matching said light sensors and in cooperation therewith, and rigidly attached to said frame member; and
c. a plurality of drum-shaped masks, at least one of said plurality of masks having a smaller circumference than another one of said plurality of masks, and said masks are disposed interjacent said light sources and said light sensors, masks are rigidly attached to an arm, said arm rotationally moveable relative to said frame member, wherein said masks interrupt said cooperation between said light sources and said light sensors as a function of rotational movement of said arm wherein at least two of said drum-shaped masks are positioned relative to each other having a first mask at least partially inside the second mask.

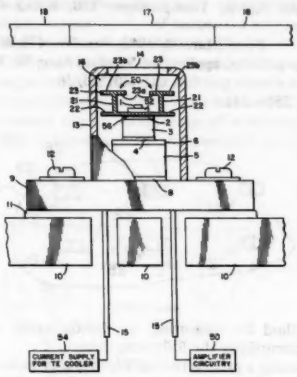
4,555,626

RADIATION SHIELD IN LIGHT DETECTOR AND/OR ASSEMBLY

Arata Suzuki, Ramsey, N.J., assignor to Capintec Inc., Ramsey, N.J.

Filed Aug. 3, 1982, Ser. No. 404,825
Int. Cl.[4] H01J *5/02*
U.S. Cl. 250—239 **17 Claims**

1. A radiation shield for use with a detector disposed in and defining a first horizontal plane, a thermoelectric cooler adapted to cool said detector, a case enclosing a volume of space about said detector and said cooler, a light-transmissive window in said case adapted to admit radiation into the enclosed volume and onto said detector, means for electrically coupling said detector and said cooler to respective external circuitry, said shield comprising:
a first shield means being disposed in a second horizontal plane parallel to and vertically spaced from said detector and said first horizontal plane, and disposed within said enclosed volume, said first shield means having an opening therein to allow the radiation admitted through said light-transmissive window to impinge on said detector;
a second shield means extending vertically between the first and second horizontal planes; and
said first shield means having portions extending both inward and outward with respect to said detector and said second shield means;



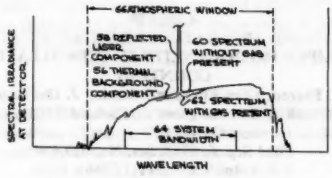
whereby to shield said detector from radiation not admitted through said light-transmissive window.

4,555,627

BACKSCATTER ABSORPTION GAS IMAGING SYSTEM

Thomas G. McRae, Jr., Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 5, 1983, Ser. No. 482,380
Int. Cl.[4] G01N *21/35*
U.S. Cl. 250—334 **17 Claims**



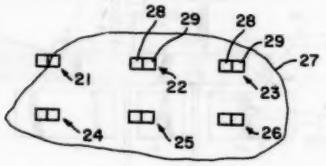
1. Method for detecting the presence of an invisible cloud of gas over a terrain, comprising:
irradiating an area of the terrain within infrared laser radiation at a single wavelength which is absorbed by the gas and reflected or backscattered by the terrain;
detecting background infrared radiation from the irradiated area of the terrain;
detecting backscattered laser radiation from the irradiated area of the terrain;
producing an image of the terrain from the background radiation;
enhancing the image of the terrain with the backscattered laser radiation, the irradiating infrared radiation being of sufficient power so that the enhancement of the image by backscattered radiation is about equal in brightness to the image produced by the background radiation;
producing a region of detectable contrast or shadow over the image of the terrain when the gas is present, said region being primarily due to absorption of the laser light by the gas.

4,555,628

METHOD FOR MEASURING THE CAMOUFLAGING CAPACITY OF A SMOKE

Bengt-Ake Agren, Trumpetvägen 100, S-633 47 Eskilstuna, Sweden

Filed Mar. 25, 1983, Ser. No. 478,987
Claims priority, application Sweden, Mar. 30, 1982, 8202007
Int. Cl.⁴ G01S *5/16*
U.S. Cl. 250—341 **5 Claims**



1. Method for measuring the camouflaging capacity of a smoke, comprising the following steps:

(a) locating a predetermined number n of radiating elements side by side to form a group, n being an integer >1;

(b) selecting the radiation intensities of said radiating elements such that the intensities are mutually different and increases on a scale with respect to the background radiation level;

(c) locating a radiation detector facing towards said group of radiating elements;

(d) spacing said radiating elements within said group sufficiently apart from one another such that said radiation detector can detect said radiating elements as n separate and individual items having mutually different high radiation intensity peaks;

(e) discharging said smoke in an area between said radiation detector and said group of radiating elements, said smoke thereby causing a change of said background radiation level; and

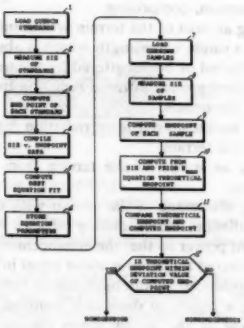
(f) counting the number of said radiation peaks which cannot be distinguished by said radiation detector with respect to said changed background radiation level.

4,555,629

METHOD AND APPARATUS FOR DETERMINATION OF SAMPLE HOMOGENEITY IN SCINTILLATION COUNTING

Leroy J. Everett, Glen Ellyn, and Stanley J. DeFilippis, Woodridge, both of Ill., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Sep. 6, 1983, Ser. No. 529,439
Int. Cl.⁴ G01T *1/204*
U.S. Cl. 250—362 **5 Claims**



1. A liquid scintillation counting system for use with a test sample containing one, or more, radioactive isotopes together with a liquid scintillator, the degeneration of an isotope distributed in a known manner over spectrum, comprising:

transducer means for converting each pulse emanating from said test sample to an electrical signal proportional thereto;

coincidence means connected to said transducer means for eliminating pulses which do not fall within a predetermined time differential window thus passing only those pulses which relate to a nuclear event;

quantizing means connected to said coincidence means for identifying a parameter of each pulse passed by said coincidence means;

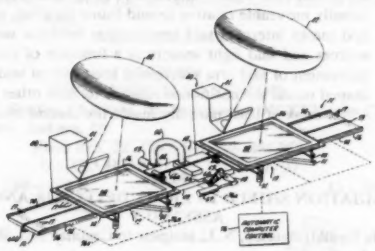
processing means, including storage means, connected to said quantizing means for receiving and storing parameter data related to each nuclear event, for calculating the radionuclide endpoint, for calculating a calibration curve associated with each radioactive isotope, and for comparing the computed endpoint of a test sample with the theoretical endpoint to determine if said test sample deviates by more than a predetermined amount thereby identifying heterogeneous states.

4,555,630

AUTOMATIC SYSTEM FOR EXPOSING AND HANDLING DOUBLE-SIDED PRINTED CIRCUIT BOARDS

Ronald E. Sheets, Santa Ana; George A. Barbas, Dana Point; Howard W. Doering, Jr., Garden Grove, and John R. Bjorkman, Costa Mesa, all of Calif., assignors to Tamarack Scientific Co., Inc., Anaheim, Calif.

Continuation-in-part of Ser. No. 470,571, Feb. 28, 1983, abandoned. This application Dec. 9, 1983, Ser. No. 559,746
Int. Cl.⁴ B65G *47/24*
U.S. Cl. 250—492.1 **33 Claims**



1. An automatic system for exposing and handling double-sided printed circuit boards, said system comprising:

(a) first apparatus for exposing one side of a printed circuit board, and thus causing said one side to receive an image corresponding to artwork located at said first apparatus,

(b) second apparatus for exposing the other side of said board, and thus causing said other side to receive an image corresponding to artwork located at said second apparatus, and

(c) apparatus for automatically conveying said board from said first apparatus to said second apparatus without effecting substantial scuffing of said board, and for automatically inverting said board after said one side thereof receives an image and before said other side thereof receives an image, said inverting also being effected in the absence of substantial scuffing of said board,

said means (c) comprising means to effect floating of said board on an air bearing while traveling between said first and second apparatuses.

4,555,631

APPARATUS FOR TRANSMITTING SIGNALS BETWEEN TWO RELATIVELY ROTATABLE PARTS

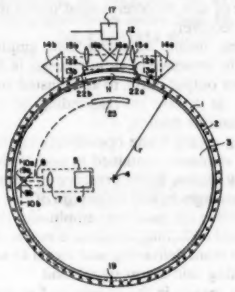
Gerhard Martens, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,544

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3205065

Int. Cl.[4] G02B 27/00

U.S. Cl. 250—551 9 Claims



1. Apparatus for transmitting signals between a first part and a second part which are relatively rotatable about an axis of rotation wherein:

the first part comprises a hollow cylinder with an axis which is disposed along the axis of rotation and having an inner reflective surface;

a portion of said second part is disposed within said hollow cylinder and reflective surface; and further comprising

a light-emitting device;

a light-receiving device, a first of said light-emitting and light-receiving devices being affixed to the first part and the second of the light-emitting and light-receiving devices being affixed to the second part;

means for directing at least one beam of light from the light-emitting device onto the reflective inner surface of the cylinder at a grazing angle which is sufficiently small so that the beam(s) are repeatedly reflected by the inner surface along a path around and within the inner surface of the hollow cylinder without intervening reflection from portions of the second part which are contained within said hollow cylinder;

coupling section means, fixedly disposed with respect to the hollow cylinder and through which the light beam(s) are transmitted so that the first of the light-emitting and light-receiving devices is an optical connection with the second of the light-emitting or light-receiving devices from every possible relative position of the first part with respect to the second part.

4,555,632

METHOD AND APPARATUS FOR ASCERTAINING THE DIMENSIONS AND POSITIONS OF FILM FRAMES ON COHERENT ROLL FILMS

Peter Vockenhuber, Concise, Switzerland, assignor to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

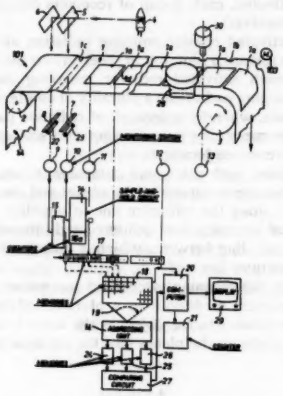
Filed Oct. 4, 1983, Ser. No. 538,999

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3237053

Int. Cl.[4] G01N 21/86; G01V 9/04

U.S. Cl. 250—560 20 Claims

1. A method of automatically ascertaining the locations and the length of image areas, particularly film frames, in each of a series of successive portions of an elongated strip of photosensitive material wherein portions having longer image areas alternate at random with portions having shorter image areas and wherein successive image areas of each portion alternate with non-image areas, particularly with frame lines, comprising the steps of effecting a relative movement between the strip and a monitoring station; photoelectrically monitoring at said station the radiation-transmissivity of successive narrow transversely extending increments of the strip during successive intervals which elapse for relative movement between said station and a longer image area and generating signals denoting the monitored transmissivity whereby the intensity of signals which are generated during monitoring of non-image areas deviates from that of signals which are generated during monitoring of image areas; storing the signal which is generated as a result of monitoring the non-image area in front of each longer or shorter image area; replacing each stored signal with a second signal, if any, whose intensity deviates unequivocally from the intensity of the stored signal, which is generated during the interval following storage of the signal denoting the monitoring of a non-image area in the course of relative movement between said station and a given portion of the strip, and which is indicative of a non-image area; and utilizing the stored signals as a criterion of the length of image areas in the corresponding portions of the strip.



4,555,633

PHOTOELECTRIC DIMENSION MEASURING SYSTEM

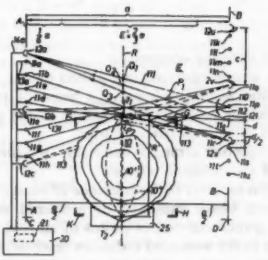
Mats Björkelund, Västerås, Sweden, assignor to Kockumation AB, Remadivisionen, Västerås, Sweden

Filed Aug. 2, 1982, Ser. No. 404,422

Claims priority, application Sweden, Aug. 26, 1981, 8105051

Int. Cl.[4] G01N 21/86

U.S. Cl. 250—560 17 Claims



1. A method of indicating the presence of an object in a measuring zone E, and of measuring with a degree of accuracy

depending on the cross-sectional shape of the object, the extent of the object along a reference line R located in the measuring zone comprising:

positioning plural groups of stationary radiation emitters and receivers on opposing sides of said measuring zone so that radiation paths between them intersect in the measuring zone, each group including at least one emitter and at least one receiver;

sucessively actuating and deactivating said emitters in a scanning sweep;

successively interrogating one group of receivers after another at the same pace as the emitters are activated and deactivated, each group of receivers comprising at least one receiver;

each activated emitter emitting radiation along diverging paths toward a plurality of receivers on the opposite side, and each activated receiver receiving radiation along converging paths from a plurality of emitters on the opposite side, whereby a network of radiation paths is created in the measuring zone having intersections with fixed predetermined locations;

determining with electronic computer means which intersections are occupied by the object and the extent of the object along the reference line to establish with said degree of accuracy two uninterrupted intersections on the reference line between which a length of screened-off intersections lies; and

repeating the scanning sweep and successive interrogation of receivers as desired in a plurality of cross-sectional planes relative to the object as the latter is transported at right angles to the planes past the emitters and receivers.

4,555,634

OPTICAL SMOKE DETECTOR WITH CONTAMINATION DETECTION CIRCUITRY

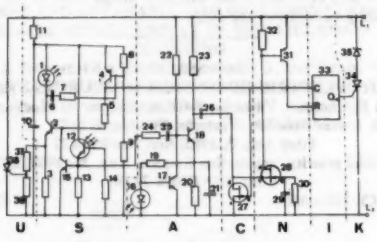
Jürg Muggli; Heinz Güttinger, and Zoltan Horvath, all of Männedorf, Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Nov. 3, 1982, Ser. No. 439,059

Claims priority, application Switzerland, Nov. 11, 1981, 7248/81

Int. Cl.⁴ G01N *21/53*; G08B *17/10*

U.S. Cl. 250—565 **15 Claims**



1. A smoke detector comprising:

a radiation source operated in a pulsed mode;

said radiation source delivering a beam of radiation and source output pulses corresponding to the pulsed mode operation of said radiation source;

a radiation receiver arranged externally of a direct radiation region of the radiation source;

said radiation receiver in the presence of smoke in the radiation region being impinged by scattered radiation and delivering receiver output pulses of an amplitude corresponding to the scattered radiation received by the radiation receiver;

an evaluation circuit containing switching elements which, when the number of source output pulses exceeds a predetermined threshold value for the number of the source output pulses, deliver a signal to a toggle stage for outputting an alarm signal;

a reference cell located in a direct beam of the transmitted radiation emanating from the radiation source and arranged near to the radiation receiver;

said reference cell controlling the transmission of radiation from the radiation source;

means for setting an amplitude threshold value for the amplitude of said receiver output pulses delivered by said radiation receiver;

means for adjusting said amplitude threshold value for the amplitude of said receiver output pulses delivered by said radiation receiver;

said adjusting means adjusting said amplitude threshold value, in the presence of slow changes in the amplitude of the receiver output pulse, to an adjusted amplitude threshold value at a rate corresponding to a time-constant greater than one minute;

said adjusting means being operatively connected with said switching elements contained in said evaluation circuit;

said adjusting means, in the presence of either no change or said slow changes in said amplitude of said receiver output pulses relative to said set amplitude threshold value, blocking said switching elements contained in said evaluation circuit from delivering said signal to said toggle stage for outputting said alarm signal; and

said adjusting means, in the presence of an amplitude of said receiver output pulses in excess of said set amplitude threshold value, enabling said switching elements contained in said evaluation circuit to deliver said signal to said toggle stage for outputting said alarm signal.

4,555,635

SURFACE FLAW INSPECTION APPARATUS FOR A CONVEX BODY

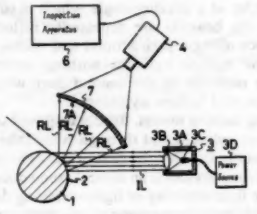
Hajime Yoshida, Chofu, Japan, assignor to Hajime Industries, Ltd., Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,165

Claims priority, application Japan, Jun. 15, 1982, 57-102699

Int. Cl.⁴ G01N *21/88*

U.S. Cl. 250—572 **8 Claims**



1. Apparatus for inspecting the surface of a convex body for flaws, comprising:

(a) a light source directly irradiating a surface of an object to be inspected with a substantially parallel light flux, said surface of the object being curved;

(b)image sensing means receiving the reflected light from said curved surface of the object and producing a corresponding electrical signal;

(c) inspection means receiving the electrical signal from said image sensing means and determining whether or not there is a flaw on the surface of said object; and

(d) a projection screen located in the light path from said light source through said curved surface of the object to said image sensing means on which the image of the irradiated area of the curved surface of the object by the parallel light flux from said light source is formed, said projection screen being curved such that each of the distances of reflected light fluxes at the respective points with the

irradiated area of said curved surface of the object is substantially equal to each other, said image sensing means picking up the image on said projection screen.

4,555,636

PATTERN DETECTOR

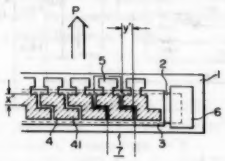
Hakubun Fujisawa; Masaharu Nishiura; Hiromu Haruki, and Yoshiyuki Uchida, all of Kanagawa, Japan, assignors to Fuji Electric Company, Ltd. and Fuji Electric Corporate Research & Development, Ltd., both of Kanagawa, Japan

Filed Sep. 14, 1982, Ser. No. 417,944

Claims priority, application Japan, Sep. 16, 1981, 56-145712

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—578 **8 Claims**



1. A pattern detector comprising a substrate; a linear array of photoelectric converter elements on said substrate, consecutive converter elements in said linear array arranged to overlap one another by a predetermined length in a direction perpendicular to the direction in which said converter elements are arrayed.

4,555,637

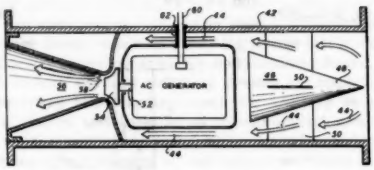
HIGH SPEED TURBOGENERATOR FOR POWER RECOVERY FROM FLUID FLOW WITHIN CONDUIT

Michael D. Irvine, La Mirada, Calif., assignor to ACD, Inc., Santa Ana, Calif.

Filed Jul. 26, 1982, Ser. No. 401,781

Int. Cl.⁴ F01D *15/10*; H02K *7/18*

U.S. Cl. 290—52 **9 Claims**



1. A power recovery system for obtaining electrical power from a flowing fluid, said system comprising:

a conduit through which a fluid passes of a predetermined minimum flow and pressure;

a restriction means in said conduit forming a flow path of reduced area for the fluid,

a high speed turbogenerator comprising an electrical generator, said electrical generator having a rotating shaft and a pair of bearings, said shaft having one end thereof extending outwardly from one of said bearings, and a radial inflow expander wheel directly affixed to the extended end of said shaft,

said high speed turbogenerator positioned entirely within said conduit and having said expander wheel adjacent said restriction means such that fluid passing through said restriction means causes rotation of said expander wheel at a speed of about 6,000 rpm to about 32,000 rpm and with a reduction in pressure,

means to pass electrical wiring carrying current from said high speed turbogenerator through said conduit to a utilization means external of said conduit.

6. A method of producing electricity from the flow of fluid through a conduit comprising the steps of:

locating entirely within the conduit an electrical generator having affixed to its main shaft a radial inflow expander wheel,

directing the flow of fluid through the radial inflow expander wheel to rotate the same,

transmitting the power generated by the electrical generator through the conduit for outside utilization.

4,555,638

FUSE AND DISTRIBUTION ARRANGEMENT BOX FOR MOTOR VEHICLES

Hartwig Lobe, Unterschleissheim, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

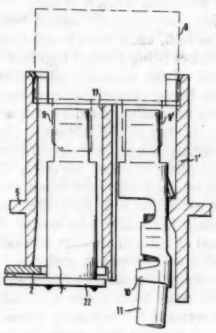
Continuation of Ser. No. 355,734, filed as PCT 81/00020, Jun. 11, 1981 § 102(e) date Feb. 12, 1982, abandoned.

This application Jan. 30, 1985, Ser. No. 696,862

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022115

Int. Cl.⁴ H05K *1/18*

U.S. Cl. 307—10 R **6 Claims**



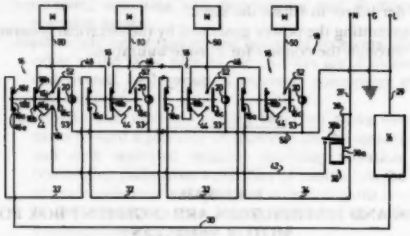
1. A fuse and distribution box arrangement for motor vehicles wherein an electrical load is connected to a printed circuit board in the distribution box by an electrical fuse, the arrangement comprising a distribution box means for housing a printed circuit board, a printed circuit board having a printed circuit connected to a power supply of a motor vehicle, an electrical fuse having a plurality of contacts, first discrete spring-biased contact means associated with an electrical load for connecting the load to one of the plurality of contacts of the fuse, and second spring-biased contact means associated with said printed circuit for connecting another of said plurality of contacts of said fuse to said printed circuit, and first spring-biased contact means including resilient means for attaching said first spring-biased contact means to said box means, said second spring-biased contact means being directly connected to the printed circuit board wherein the electrical load is connected to the printed circuit by the discrete spring-biased contact means associated with the load being positioned relative to the box means by the resilient means and the fuse interconnecting the first discrete spring-biased contact means associated with the load to the second spring-biased contact means associated with the power supply of the vehicle.

4,555,639

MONEY-OPERATED UNIT CONTROL SYSTEM

Bernard Melek, 92 Dunthorne Ct., Scarborough, Ontario, Canada (M1B 2S9)

Filed Jun. 28, 1984, Ser. No. 625,775
Int. Cl.[4] G07F *13/00, 5/18*
U.S. Cl. 307—38 5 Claims



1. A central control panel to be used in association with a source of electric power, defining at least two power terminals, and a plurality of electrical units, each such unit including a unit controller device operable to control the functioning of the unit upon delivery of a start signal to the unit controller device, the start signal being a signal from a pre-determined terminal of the power source, wherein the control panel comprises:

a power input means connectable to a first power terminal of the power source;

a plurality of electrical switch means, each such switch means defining two normally closed switches and a normally open switch, each switch defining two terminals, the three switches being ganged together for simultaneous operation, one of the normally closed switches of each switch means being connected in a first series to each corresponding normally closed switch and to the power input means, another of the normally closed switches of each switch means being connected in a second series with each corresponding another normally closed switch, a first terminal of each normally open switch being connected to an electrical unit controller device, a second terminal of each normally open switch being connected with a terminal of the said another normally closed switch within the same switch means, and,

a control relay means, including an energizing circuit and a normally open relay switch, the energizing circuit being connected in series to the normally closed switch of a last switch means in the said first series, the energizing circuit being connectable to the second power terminal of the power source, whereby a voltage difference may be defined across the energizing circuit, the relay switch being connectable between the pre-determined terminal of the power source and the normally closed switch of the first switch means in the said second series.

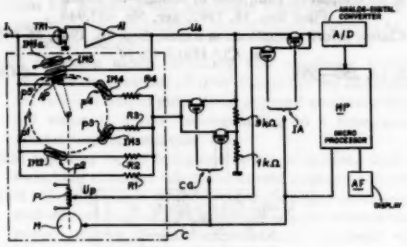
4,555,640

AUTOMATIC HIGH INSULATION SWITCH

Bernard Bonnet, Paris; Roger Bressy, le Plessis Robinson, and Jean-Claude Sevaille, Savigny le Temple, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 8, 1983, Ser. No. 511,923
Claims priority, application France, Jul. 9, 1982, 82 12115
Int. Cl.[4] H01H *19/00*
U.S. Cl. 307—115 2 Claims

1. A high insulation automatic switch with a low consumption level and small overall dimensions, which is to be associated with an electrometric apparatus constituted by an integrated amplifier, preceded by at least one field effect transistor having an insulated gate and a very low leakage current, the transistor-amplifier assembly being linearly negatively fed back by high value resistors, switched in accordance with the range of measurements to be used by flexible reed interrupters or switches and magnetically controlled by a permanent magnet, wherein the high insulation automatic switch also comprises a servomechanism with a motor and a potentiometer for positioning the permanent magnet facing one of the magnetically controlled, flexible reed interrupters, means being provided for comparing the output voltage of the amplifier and the voltage supplied by the potentiometer with reference values characterizing the position of the permanent magnet and



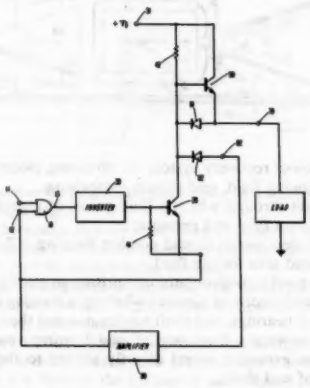
consequently controlling the motor, wherein another magnetically controlled, flexible reed switch, facing which is positioned the permanent magnet stopping the apparatus, ensures the short-circuiting of the transistor-amplifier assembly, when the apparatus is deenergised, and wherein the other magnetically controlled, flexible reed interrupter is associated with another magnetically controlled, flexible reed interrupter for cutting off the power supply to the measuring apparatus in the stop position.

4,555,641

PULSE SIGNAL CONTROL CIRCUITS WITH IMPROVED TURN-OFF CHARACTERISTIC

Hiroshi Hada, and Tsutomu Hirayama, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 23, 1983, Ser. No. 497,047
Claims priority, application Japan, May 24, 1982, 57-87476
Int. Cl.[4] H03K *17/60*
U.S. Cl. 307—254 6 Claims



1. A pulse signal control circuit comprising first and second transistors, a first diode connected between the emitter and base electrodes of said first transistor, said first diode having a polarity opposite to the diode characteristic between said emitter and base electrodes, a resistor having a high resistance

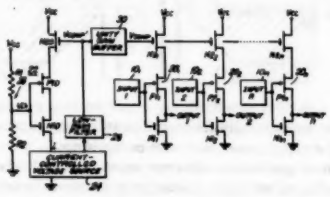
connected between the collector and base electrodes of said first transistor, a source of a reference potential connected to the collector electrode of said first transistor, means for connecting the collector electrode of said second transistor to the base electrode of said first transistor and to a second diode, a source of a first high frequency pulse signal connected to the emitter electrode of said second transistor, a source of a second high frequency pulse signal having the same phase as said first high frequency pulse signal connected to the collector electrode of said second transistor through said second diode, and a source of a pulse data input signal containing a high frequency input pulse signal connected to the base electrode of said second transistor, the phase of said high frequency input pulse signal being opposite to that of said first and second high frequency pulse signals, thereby producing an amplified pulse data output signal corresponding to said pulse data input signal on the emitter of said first transistor, said pulse data output signal containing a high frequency signal.

4,555,642

LOW POWER CMOS INPUT BUFFER CIRCUIT

Louis J. Morales, Nesconset, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,783
Int. Cl.[4] H03K *19/01, 19/017, 19/092*
U.S. Cl. 307—475 **9 Claims**



1. An input buffer circuit comprising at least one buffer stage having an input for receiving a signal at one of two logical levels, an output, a first switching device connected between said input and said output, and a first control device connected to said first switching device; and an additional dummy input buffer stage having a second switching device and a second control device connected to said second switching device, said control devices and said switching devices are respectively complementary MOS devices means for applying an input signal at one of said logic levels to said second switching device to cause said second switching device to be conductive, and sensing means coupled to said second switching device and wherein said sensing means includes a source of a reference current operatively coupled to said first control device for comparing the current from said second switching device against said reference current and for producing a control signal responsive to that comparison; and means for applying said control signal to said second control device and to said first control device in said one buffer stage to tend to minimize the current in said first switching device.

4,555,643

SUPERCONDUCTING LOGIC CIRCUIT AND SUPERCONDUCTING SWITCHING DEVICE THEREFOR

Nobuo Kotera; Yuji Hatano, both of Kokubunji; Atsushi Asano, Hachioji, and Ushio Kawabe, Hamuramachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,716
Claims priority, application Japan, Jul. 1, 1981, 56-101221
Int. Cl.[4] H03K *19/195*
U.S. Cl. 307—476 **10 Claims**

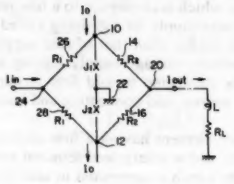
1. A superconducting logic circuit comprising:

a first power source terminal connected with a current source;

a second power source terminal connected with a current sink;

a first superconducting switching device connected between said first power source terminal and ground, said first superconducting switching device having a control terminal;

a second superconducting switching device connected between said second power source terminal and ground, said second superconducting switching device having a control terminal; p1 first and second resistors having one terminal thereof connected with said first and second power source terminals, respectively; and



third and fourth resistors having one terminal thereof connected with the control terminals of said first and second superconducting switching devices, respectively,

wherein said first and second resistors have another terminal thereof connected with each other at a node to provide a logic output terminal, and

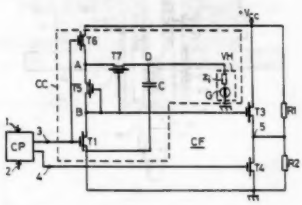
wherein said third and fourth resistors have another terminal thereof connected with each other at a node to provide a logic input terminal.

4,555,644

OUTPUT INTERFACE FOR A THREE-STATE LOGIC CIRCUIT IN AN INTEGRATED CIRCUIT USING MOS TRANSISTORS

Daniele Devecchi, Desio, and Guido Torelli, S. Alessio, both of Italy, assignors to SGS-ATES Componenti Elettronici SpA, Agrate Brianza, Italy

Filed Dec. 12, 1983, Ser. No. 560,401
Claims priority, application Italy, Dec. 17, 1982, 24816 A/82
Int. Cl.[4] H03K *4/24, 17/06, 19/096, 4/58*
U.S. Cl. 307—482 **3 Claims**



1. An output interface circuit for a three-state logic circuit in an integrated circuit using MOS transistors having a single type of charge carriers, comprising:

a supply voltage source having first and second power supply terminals;

an output stage having first and second enhancement type transistors which are connected in series between said first and second terminals of said supply voltage source, said output stage having an output terminal constituting a junction point between a drain electrode of said first tran-

sistor and a source electrode of said second transistor, gate electrodes of said first and second transistors being respectively connected to a first and a second output of said three-state logic circuit so as to provide an output at said output terminal of said output stage which corresponds to the three states of said three-state logic circuit which in turn correspond to combinations of binary logic states of said first and second outputs of said three-state logic circuit;

wherein a connecting and biasing network is connected between said gate electrode of said second transistor and said second output of said three-state logic circuit, said connecting and biasing network having an auxiliary feed terminal which is connected to a first terminal of an auxiliary voltage supply for supplying a predetermined voltage which is higher than that of said supply voltage source, said auxiliary voltage supply having a second terminal which is connected to said first terminal of said supply voltage source, said connecting and biasing network comprising:

a capacitive element having a first electrode which is connected to said auxiliary feed terminal and having a second electrode which is connected to said first terminal of said supply voltage source;

a switching means connected to said gate electrode of said second transistor and to said first electrode of said capacitive element and to said second output of said three-state logic circuit, said switching means connecting said first electrode of said capacitive element to said gate electrode of said second transistor via a low-resistance path when said second output of said logic circuit is in a predetermined binary state and substantially isolating said capacitive element when said second output of said logic circuit is in a binary logic state which is opposite to said predetermined binary logic state.

4,555,645

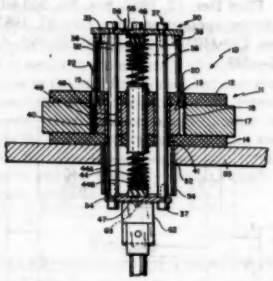
MOVEABLE COIL LINEAR MOTOR

Robert W. Atkinson, Dover, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

Continuation of Ser. No. 445,792, Dec. 1, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 581,514

Int. Cl.[4] H02K *33/00*

U.S. Cl. 310—27 **6 Claims**



1. An alternating current linear motor comprising:

a coil support;

a moveable coil attached to said coil support;

a stationary core including a bearing; and

a drive member spaced from said coil and connected to said coil support, said drive member comprising a shaft, said shaft being moveable in said bearing and passing through the core, said coil support being connected to said shaft at a first location on one side of said core, said shaft being connected with a device to be powered by said motor at a second location on the opposite side of said core, and said moveable coil and said coil support remaining spaced from the opposite side of said bore so as to be compactly arranged on the one side of said core, and said stationary core defining a slot surrounding said bearing to movably receive said moveable coil therein.

4,555,646

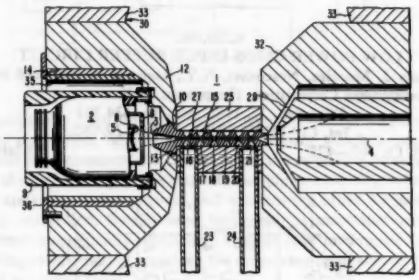
ADJUSTABLE BEAM PERMANENT-MAGNET-FOCUSED LINEAR-BEAM MICROWAVE TUBE

George V. Miram, Atherton, and Yosuke M. Mizuhara, Palo Alto, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 309,366, Oct. 7, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 587,837

Int. Cl.[4] H01J *23/08*

U.S. Cl. 315—5.35 **24 Claims**



1. A magnetically-focused linear beam microwave tube having a central axis, said tube comprising:

electron gun means adjacent one end of said tube for originating a strongly converging electron beam, said gun including a cathode having a concave emitting surface, and an envelope means, said envelope means including electrically insulating material, said gun operable at a high voltage;

collector means at the opposite end of said tube for collecting the electrons of said beam;

means disposed between said gun and collector alongside said beam for supporting energy-exchanging electron beam-microwave interaction;

said electron gun means, said means for supporting energy-exchanging interaction, and said collector means being in a vacuum-tight relationship;

an anode having a passage therethrough for accepting said beam from said gun, said anode operable at a voltage which is positive with respect to said cathode;

magnetic circuit means for focusing said beam to a substantially uniform and narrow diameter within said interaction means, said circuit means including a polepiece extending about said gun;

means for externally adjusting primarily the magnetic field acting on said cathode, said means for adjusting the magnetic field being substantially at ground potential during tube operation, said means for adjusting the magnetic field including magnetic material disposed within said polepiece outside and adjacent said envelope means, and being moveable axially about said cathode during tube operation, said magnetic material including at least one permanent magnet portion, whereby the diameter of said electron beam may be optimized, while maintaining variations in said beam diameter with beam travel at a negligible level; and

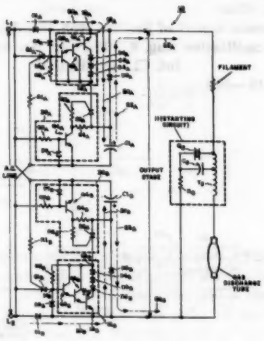
means for fixing the position of said means for adjusting the magnetic field after beam diameter optimization.

4,555,647

BALLAST CIRCUIT FOR GAS DISCHARGE TUBES UTILIZING TIME-PULSE ADDITIONS

Robert A. Leskovec, Richmond Hts.; John M. Davenport, Lyndhurst, and Pieter J. von Herrmann, Shaker Hts., all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 538,246, Oct. 3, 1983, abandoned. This application Jun. 27, 1985, Ser. No. 749,129
Int. Cl.[4] H05B *35/00*
U.S. Cl. 315—179 7 Claims



1. In a lighting unit having a gas discharge tube as a main light source, a starting circuit for said gas discharge tube, a filament serving as a resistive element and as a supplementary light source, and an operating circuit for controlling the steady state run mode of operation of said gas discharge tube, the improvement wherein said operating circuit comprises:

a first and a second input terminal for having applied thereacross an alternating current (A.C.) source voltage;

an output stage having a first and a second terminal which has connected thereacross a serial arrangement of said filament and said gas discharge tube;

a capacitive energy storage means comprising a first capacitor and a second capacitor each provided with means connected to one end thereof for respectively charging each of said first and second capacitors during a preselected portion of said applied (A.C.) voltage and each of said first and second capacitors having the other end thereof connected respectively to an opposite input terminal of said operating circuit

a switching means comprising first and second current control devices each having a first, a second and a third terminal;

a first bias network and a second bias network respectively connected to said first terminal of each of said first and said second current control device, said first and said second bias networks being respectively responsive to a selected portion of the cycle of said A.C. voltage effective to respectively render said first and said second current control devices conductive; and

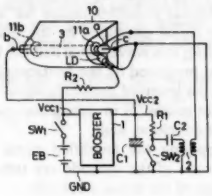
said first and said second current control devices each respectively having its second terminal connected to opposite terminals of said output stage, and each of said first and second current control devices having its third terminal respectively connected to said first end of said first and second capacitors effective to respectively discharge said first and second capacitors across said gas discharge tube when said first and second current control devices are rendered conductive.

4,555,648

ELECTRONIC FLASH UNIT UTILIZING PRE-FLASH ILLUMINATION OF FLASHTUBE

Yoshikazu Iida, Chigasaki, and Nobuyoshi Hagyuda, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,346
Claims priority, application Japan, Aug. 13, 1982, 57-139695
Int. Cl.[4] H05B *41/32*
U.S. Cl. 315—241 P 5 Claims



1. An electronic flash unit for emitting flashlight toward an object to be photographed in order that a camera may obtain proper exposure, comprising:

(a) flash means having a flash tube which emits flashlight;

(b) means for driving said flash tube in order that said flash tube may emit flashlight, said driving means including capacitor means chargeable with charge and producing a voltage corresponding to the charge;

means for supplying charge to said capacitor means;

trigger means for applying a trigger to said flash tube in order that said flash tube may emit flastlight; and

means responsive to the triggering of said flash tube by said trigger means to discharge the charge in said capacitor toward said flash tube;

(c) means for applying light to the interior of said flash tube prior to said driving means causing said flash tube to emit flashlight; and

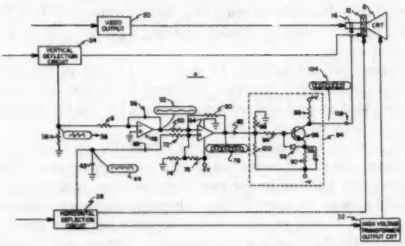
(d) operating means for said supply means to start the supply of charge to said capacitor means and wherein said means for applying light applies light to the interior of said flash tube in response to operation of said operating means.

4,555,649

CATHODE RAY TUBE FOCUSING CIRCUITRY

Gulab Sharma, Salt Lake City, Utah, assignor to Beehive International, Salt Lake City, Utah

Filed Dec. 5, 1983, Ser. No. 557,959
Int. Cl.[4] H01J *29/58*
U.S. Cl. 315—382 5 Claims



1. Cathode ray tube focusing circuitry for use in a cathode ray tube video circuit which includes a cathode ray tube having a generally rectangular screen and a focus electrode for producing a D.C. voltage for controlling the focusing of the electron beam of the cathode ray tube, a vertical deflection

circuit which produces a first sawtooth wave signal which identifies the vertical location on the screen of the electron beam, and a horizontal deflection circuit which produces a second sawtooth wave signal which identifies the horizontal location on the screen of the electron beam, said horizontal deflection circuit including a capacitor which produces an inverted parabolic wave signal from the second sawtooth wave signal, said focusing circuitry including:

first operational amplifier means coupled to the vertical deflection circuit for producing a parabolic wave signal from the first sawtooth wave signal;

second operational amplifier means for inverting the parabolic wave signal produced by the first amplifier means and for adding this wave signal and the inverted parabolic wave signal produced by the horizontal deflection circuit to produce an inverted parabolic signal envelope;

linear amplifier means for inverting and amplifying the parabolic signal envelope; and

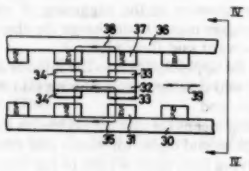
means for applying the amplified signal envelope to the focus electrode of the cathode ray tube to modulate the D.C. voltage of the focus electrode.

4,555,650

TWO DIMENSIONAL DRIVING DEVICE FOR USE IN A POSITIONING DEVICE IN A SEMICONDUCTOR MANUFACTURING APPARATUS

Teruo Asakawa, Nirasaki, Japan, assignor to Telmec Co., Ltd., Nirasaki, Japan

Filed Apr. 4, 1983, Ser. No. 481,737
Claims priority, application Japan, Apr. 7, 1982, 57-57848
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—135 **5 Claims**



1. A current-motion converter is provided comprising:

a magnetic field group formed from a plurality of magnetic fields disposed on a plane in a two-dimensional array with an equal predetermined distance between the centers of the magnetic fields with respect to the two dimensions of the array, the magnetic fields of the array being disposed perpendicular to the plane and adjacent magnetic fields being directed in alternate directions;

a first coil set adapted to generate a force in one direction of said two-dimensional magnetic field group, said first coil set being formed by fixedly securing a plurality of coils to each other;

a second coil set adapted to generate a force in the other two-dimensional direction different from said one direction, said second coil set being formed by fixedly securing a plurality of coils to each other;

each coil of said coil sets being generally rectangular in shape, the side dimensions of said rectangular coils being generally parallel to the two-dimensions of said magnetic field group, the sides of the coils extending approximately one-half of said predetermined distance between the centers of the fields of said magnetic field group, and the coils of said coil sets being provided with a predetermined spacing approximately equal to said predetermined distance of the two-dimensions of said magnetic field group;

a coil group formed by fixedly securing said coil sets to each other, said coil group being disposed within said magnetic field group so as to be freely movable along said plane;

a detector device for registering a position of an armature in said converter;

a current distribution signal generator device responsive to a value applied to said current distribution signal generator device by said detector device; and

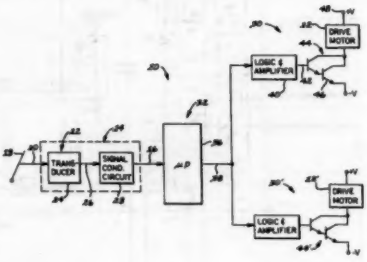
a group of amplifiers having amplification factors controlled by said current distribution signal generator device.

4,555,651

MOTOR SPEED CONTROL APPARATUS

Grant C. Melocik, Chardon, and William Pickering, University Heights, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 455,775, Jan. 5, 1983. This application Aug. 8, 1984, Ser. No. 638,850
Int. Cl.[4] H02P *5/06*
U.S. Cl. 318—341 **6 Claims**



1. Appparatus (10) for controlling the rate of acceleraton of an electric motor (12) of a vehicle, said vehicle having a power source (48), comprising:

generating means (14) for producing a predetermined plurality of motor speed command signals, each signal having an incrementally different digital value;

processor means (32) for receiving each of said motor speed command signals, producing an accelerator ramp signal in response to receiving said motor speed command signals, said accelerator ramp signal having a predetermined digital value, storing said produced accelerator ramp signal within said processor means (32), producing predetermined successive motor speed limit signals each for a first predetermined period of time in response to said received motor speed command signal having a digital value geater than said stored accelerator ramp signal digital value and to said stored accelerator ramp signal digital value being in a first predetermined range of values, and incrementing said accelerator ramp signal to the next successive value in response to each successive motor speed limit signal being produced for said first predetermined period of time; and

controllable supplying means (30) for receiving said motor speed limit signals and controllably coupling said power source (48) to said motor (12) in response to said received motor speed limit signals.

4,555,652

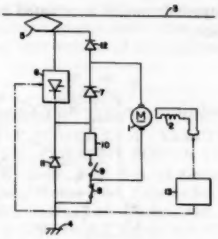
CONTROL CIRCUIT FOR OPERATING A DIRECT CURRENT MOTOR DURING TRACTION OR BRAKING

Michel C. Brulard, Clamart, France, assignor to Jeumont-Schneider Corporation, France

Filed Oct. 22, 1981, Ser. No. 313,641
Claims priority, application France, Oct. 30, 1980, 80 23209
Int. Cl.[4] H02P *3/12*
U.S. Cl. 318—375 **1 Claim**

1. A control circuit for operating from a power supply a separately excited direct current motor, as of the type used to drive railway traction vehicles, said circuit operating during traction and during regenerative and dynamic braking, said

circuit including a chopper and energy dissipation resistor means, said chopper comprising thyristor means, said circuit being characterized in that a first branch of the circuit, connected between the power supply and ground, includes first diode means and said thyristor means, each having an anode and a cathode, the anode of the thyristor means being connected to said power supply and the cathode of said first diode means being connected to the cathode of said thyristor means, in that the thyristor means is shunted across a second branch of the circuit including a second and a third diode means, and in



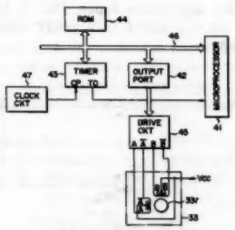
that the first diode means is shunted across a third branch of the circuit including said resistor means series-connected with two alternately closed circuit breakers, and in that said motor is connected between the junction point of said second and third diode means and the junction point of said two circuit breakers, one of said circuit breakers being closed during traction to connect said junction of said circuit breakers to ground and the other of said circuit breakers being closed during regenerative and dynamic braking to connect said resistor means in series with said motor.

4,555,653

PULSE MOTOR DRIVING APPARATUS

Yoshiaki Nawata, Yokohama, and Yasufumi Tanimoto, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 1, 1983, Ser. No. 556,786
Claims priority, application Japan, Dec. 2, 1982, 57-211950
Int. Cl.[4] H02K *29/04*
U.S. Cl. 318—696 **2 Claims**



1. A pulse motor driving apparatus for driving a pulse motor having a plurality of phase windings, said apparatus comprising:

exciting phase specifying means for sequentially specifying said plurality of phase windings of said pulse motor, on a two-phase unit basis in a driving mode, and for specifying only one of said phase windings in a stopping mode, said exciting phase specifying means including:

(a) means for sequentially outputting phase change-over timing signals, comprising memory means in which phase change-over timing data has been memorized, and timer means whose times are set in response to the timing data of said memory means and which outputs said timing signals at the set times, and

(b) means for specifying the exciting phases in response to said timing signals; and

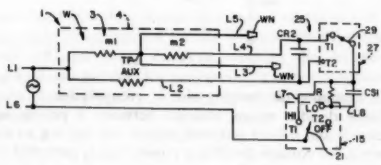
means for supplying driving pulses to the specified two of said phase windings in said driving mode, and for supplying a driving pulse to only one of said phase windings in said stopping mode for stopping said motor.

4,555,654

MEANS FOR REVERSING OPERATION OF A MOTOR

Gene V. Spradling, and Terrence L. Stanek, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 26, 1984, Ser. No. 604,070
Int. Cl.[4] H02P *1/44*
U.S. Cl. 318—751 **2 Claims**



1. In a capacitor run motor having a stator including an auxiliary winding and a main winding, said main winding having at least two main winding portions with a tap point therebetween, a run capacitor connected to said main and auxiliary windings, said run capacitor being located externally of said stator and externally of said windings, and a multiple-position speed selector switch for controlling the speed of the motor and for energization/de-energization of the motor, said speed selector switch having a movable switch member, a first terminal and a second terminal, said motor being operable at high speed when only one of said main winding portions is energized, and being operable at a slower speed mode of operation when others of said main winding portions are energized in series with said one main winding portion, said motor having a plurality of leads extending externally of said stator, including a first power lead connected to said auxiliary and main windings, a second lead connected between said auxiliary winding and one side of said run capacitor, a third lead connected between the other side of said run capacitor and one of said tap points, a fourth lead connected to said main winding and to one of said speed selector switch terminals, a fifth power lead connected between said tap point and to the other of said terminals of said speed selector switch, and a sixth power lead of said speed selector switch for supplying electrical power thereto, wherein the improvement comprises: a reversing switch mounted exteriorally with respect to said motor, said reversing switch having a movable switch member and a pair of terminals, said first and second terminals of said speed selector switch being connected to said movable switch member of said reversing switch, a speed control capacitor in series with one of said terminals of said speed selector switch and said movable member of said reversing switch for operation of the motor at a slow speed mode of operation, said run capacitor being connected exteriorally of said motor so as to be connected in parallel between said second and fourth leads, said reversing switch having one of its terminals connected to said fourth power lead, and its other terminal connected to said second power lead whereby with power supplied by said speed selector switch to said reversing switch, and with said reversing switch in one of its operating positions, said auxiliary winding and said run capacitor are in series with one another, and

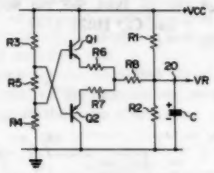
said main windings are in series such that said motor operates in one direction, and whereby with said reversing switch in its other position, said main windings and said run capacitor are in series such that said motor operates in the opposite direction.

4,555,655

CHARGING/DISCHARGING CIRCUIT

Tatsuo Tanaka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 23, 1984, Ser. No. 592,857
Claims priority, application Japan, Mar. 31, 1983, 58-56075
Int. Cl.⁴ H03G *3/00*
U.S. Cl. 320—1 **14 Claims**



1. A charging/discharging circuit, comprising:

voltage divider means coupled between a power supply circuit and a fixed potential circuit and having an output node, for voltage-dividing a power supply potential difference between the power supply circuit and the fixed potential circuit, and providing at the output node a reference potential corresponding to said power supply potential difference;

a capacitor coupled between said output node and said fixed potential circuit;

charging means coupled between said power supply circuit and said output node and being responsive to a potential at said output node, for feeding a charge current from said power supply circuit to said capacitor means when said power supply potential difference has a given high value and the potential at said output node is lower than a first given potential which corresponds to said reference potential, said charging means stopping the feeding of said charge current when the potential at said output node exceeds said first given potential; and

discharging means coupled between said fixed potential circuit and said output node and being responsive to the potential at said output node, for feeding a discharge current from said capacitor means to said fixed potential circuit when said power supply potential difference has a given low value and the potential at said output node exceeds a second given potential which is lower than said first given potential, said discharging means stopping the feeding of said discharge current when the potential at said output node is lower than said second given potential.

4,555,656

GENERATOR AND RECHARGEABLE BATTERY SYSTEM FOR PEDAL POWERED VEHICLES

David Ryan, 3595 Sante Fe Ave., Space 77, Los Angeles, Calif. 90810

Filed Jan. 20, 1984, Ser. No. 572,398
Int. Cl.⁴ H02J *7/00*
U.S. Cl. 320—5 **24 Claims**

20. A generator - rechargeable battery system for use with pedal powered vehicles which have an electrically operable load thereon, said system comprising:

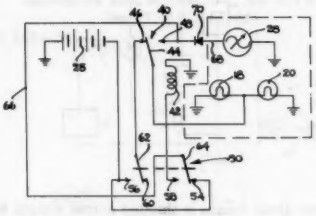
(a) a generator operable by a moving member of the vehicle when propelled to generate an electrical current,

(b) a battery providing a source of stored electric power sufficient to operate an electrical load on said vehicle,

(c) manually operable switch means operable by an operator of the vehicle for switching between a first mode of operation in which the battery is connected to the generator in such manner that the generator recharges the battery, and a second mode of operation in which the generator and the battery individually and at different times supply power to the load, said manually operable switch means comprising a first terminal connected to said battery and a second terminal connected to said battery,

(d) a relay means operable when the manually operable switch means is in the second mode, said relay means comprising:

(1) a relay coil energizable at selected times when the manually operable switch is actuated to operate in the second mode,



(2) and a relay switch operable by said relay coil, said relay switch being connected to maintain a connection of the generator to the load for as long as current is generated thereby, said relay coil being de-energized and said relay switch maintains a connection of the battery to the load and disconnecting the generator when the generator is not generating current, and

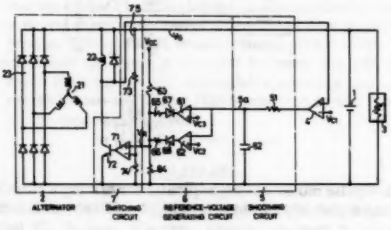
(e) as only one electronic component of said system a diode which is connected to permit current generated at said generator to flow into said system but, which precludes current from flowing back to said generator.

4,555,657

VOLTAGE REGULATOR FOR ALTERNATOR OF VEHICLE

Hidetoshi Kato, Anjo; Toshinori Maruyama; Hajime Matsushashi, both of Kariya, and Yoshio Akita, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 2, 1983, Ser. No. 557,529
Claims priority, application Japan, Dec. 6, 1982, 57-213497
Int. Cl.⁴ H02J *7/14*; H02P *9/04*
U.S. Cl. 320—64 **3 Claims**



1. A voltage regulator for an alternator of a vehicle, having a rotor coil for charging a battery of the vehicle in proper condition, comprising:

(a) switching means for controlling a current flowing through the rotor coil of the alternator to regulate an output voltage from the alternator or a voltage for charging the battery to a predetermined value;

(b) means for detecting an average conduction rate of said

switching means and generating an output signal indicative of said detected average conduction rate; and

(c) means responsive to the output signal from said detecting means for generating and issuing a reference voltage to said switching means, which determines the predetermined value of the voltage to be regulated by said switching means;

said switching means comprising a switching transistor connected in series with the rotor coil of the alternator and said detecting means comprising a comparator for generating an output signal of "0" state or "1" state when said switching transistor is rendered conductive and an output signal of "1" state or "0" state when said switching transistor is rendered nonconductive through detection of a collector-to-emitter voltage of said switching transistor.

4,555,658

CIRCUIT ARRANGEMENT FOR THE COMPENSATION OF REACTIVE POWER IN AN ELECTRICAL ALTERNATING-CURRENT POWER SYSTEM

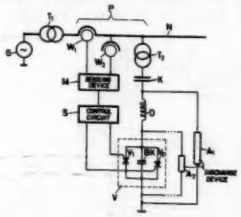
Michael Häusler, Weilheim, Fed. Rep. of Germany; Philippe Huber, Nussbaumen; Walter Pfyl, Ennetbaden, both of Switzerland, and Kadry Sadek, Lauchringen, Fed. Rep. of Germany, assignors to BBC Brown, Boveri and Company, Limited, Baden, Switzerland

Filed Nov. 1, 1983, Ser. No. 547,587

Claims priority, application Switzerland, Nov. 2, 1982, 6354/82

Int. Cl.[4] H02J *3/18*

U.S. Cl. 323—210 **6 Claims**



1. An electrical circuit for the compensation of reactive power in an electrical alternating-current power system, comprising:

a capacitor;

an inductor;

a thyristor rectifier;

said capacitor, said inductor and said rectifier being connected in a first series circuit to said power system;

a first overvoltage discharge means connected in parallel to a second series circuit of said inductor and said rectifier; and

a second overvoltage discharge means connected in parallel with said rectifier containing a protective level at least as high as that of said first overvoltage discharge means.

4,555,659

STATIC VAR GENERATOR SYSTEM HAVING IMPROVED RESPONSE TIME

Laszlo Gyugyi, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1984, Ser. No. 584,203

Int. Cl.[4] G05F *1/70*

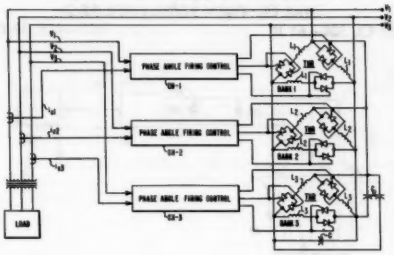
U.S. Cl. 323—210 **2 Claims**

1. A static VAR generator, comprising:

(a) a plurality of reactance means connected to anti-parallel thyristors for connection into an AC network;

(b) a VAR monitoring means connected to the A.C. network for monitoring its reactive requirements;

(c) a plurality of control means connected to the VAR monitoring means and each of said plurality of control means is connected to at least one of said plurality of reactance means for individually connecting a reactance means into the A.C. network in response to its reactive requirements; and



(d) each of said plurality of control means is comprised of a phase angle firing control for the anti-parallel thyristors having different firing intervals wherein the different firing intervals provide for progressively later connection of each of said plurality of reactance means into the A.C. network.

4,555,660

CURRENT SUPPLY DEVICE FOR SERIES-FED ELECTRONIC CIRCUITS

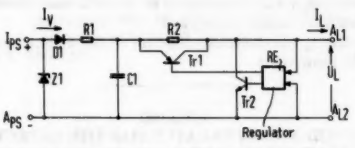
Kalixt von Winnicki, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 25, 1984, Ser. No. 603,746

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315393

Int. Cl.[4] G05F *1/613*

U.S. Cl. 323—224 **15 Claims**



1. A current supply device for a series-fed electronic consumer circuit, said supply device comprising:

input and output terminals for the feed current;

a Zener diode and a charging capacitor connected in parallel across said terminals;

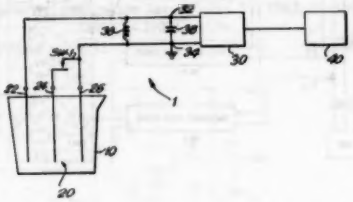
a rectifying diode and a charging resistor connected in series to said input terminal between said charging capacitor and said Zener diode; and

a regulating device having a first controllable impedance connected between said consumer circuit and said charging capacitor, a second controllable impedance connected in parallel with said consumer circuit, and a regulating means for controlling said first and second controllable impedances for maintaining the voltage across said consumer circuit constant.

4,555,661
METHOD AND APPARATUS FOR DETERMINING DIELECTRIC CONSTANT

Warren E. Benson, Needham, and Stanley Breen, Norwood, both of Mass., assignors to Forte Technology, Inc., Norwood, Mass.

Filed Apr. 11, 1983, Ser. No. 483,857
Int. Cl.[4] G01N *27/02;* G01R *27/26*
U.S. Cl. 324—61 R 30 Claims



1. A method for measuring the dielectric constant of a material in a container comprising the steps of:

placing an electrode device in the container said electrode device having first, second and third electrodes which are physically spaced relative to one another, with the third electrode located between the first and second electrodes;

connecting the first and second of the electrodes across first and second terminals at first and second electrical potentials, respectively, and leaving the third electrode at a floating electrical potential;

measuring across the first and second electrodes a first value of an electrical signal proportional to the product of the dielectric constant of the material and the distance between the first and second electrodes, while maintaining the area and the end effects of the electrodes essentially constant;

electrically switching the third electrode from the floating electrical potential to an electrical potential equal to the first electrical potential;

measuring across the second and third electrodes a second value of an electrical signal proportional to the product of the dielectric constant of the material and the distance between the second and third electrodes, while maintaining the area and the end effects of the electrodes essentially constant;

computing a third value equal to the difference between the first and second values; and

calculating the dielectric constant of the material based on the third value.

4,555,662
METHOD AND APPARATUS FOR THE DETECTION AND MEASUREMENT OF PARTICULATES IN MOLTEN METAL

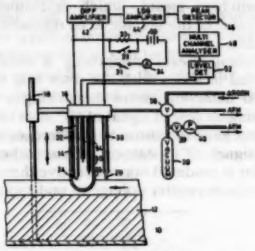
Don A. Doutre, Jonquiere, and Roderick I. L. Guthrie, Westmount, both of Canada, assignors to Limca Research Inc., Montreal, Canada

Filed Mar. 3, 1983, Ser. No. 471,908
Int. Cl.[4] G01N *27/00*
U.S. Cl. 324—71.4 9 Claims

1. A method for the detection and measurement in a molten metal sample of suspended particulates of greater than a predetermined size whose electrical conductivities differ from that of the suspending molten metal including the steps of:

establishing a current path which will include molten metal of the sample between two electrodes and through a passage of predetermined cross-sectional area,

passing the molten metal sample in the said current path and through the said passage while an electric current is maintained through the current path, and

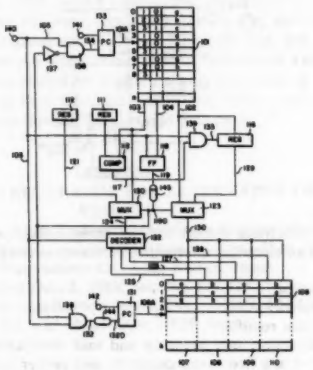


measuring the voltage difference between the said electrodes and detecting changes therein caused by the passage through the passage of said particulates.

4,555,663
TEST PATTERN GENERATING APPARATUS

Masao Shimizu, Gyoda, Japan, assignor to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,374
Claims priority, application Japan, Nov. 19, 1982, 57-203878
Int. Cl.[4] G01R *31/28;* G06F *11/00*
U.S. Cl. 324—73 R 5 Claims



1. A test pattern generating apparatus for providing test patterns for testing a logic circuit, comprising

a storage device for storing words corresponding to said test patterns, wherein each said word is divided into a plurality of test pattern blocks, and for storing block data indicating the position of each said block in each respective word and last block data indicating the last one of said test pattern blocks of each said word,

a pattern generator for storing said test pattern blocks that are provided from the storage device, and for outputting each said word one at a time during said testing of the logic circuit,

fault register means for storing fault block data indicating the position of at least one of said blocks of said pattern generator, corresponding to at least one respective fault of test pattern generating apparatus,

unused-block register means for storing unused block data indicating the position of at least one respective unused block of said pattern generator,

a comparator for comparing the block data provided from

the storage device with the fault block data provided from the fault register means,

further register means for storing each respective one of said test pattern blocks that is provided from the storage device upon each coincidence of the block data and the fault block data detected by said comparator, and

means for transferring the test pattern block corresponding to each said fault to each respective unused block of the pattern generator that is specified by the unused block data from the unused-block register means.

4,555,664

PROCESS AND DEVICE FOR INSPECTING A SURFACE IN SIMULATED MANNER WHICH DIFFERS FROM THE REAL SURFACE SCANNING BY AN EDDY CURRENT TRANSDUCER

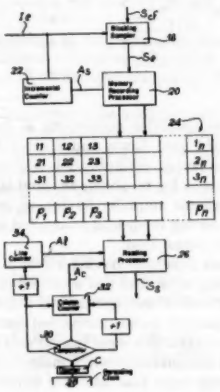
Bernard David, Gif sur Yvette, and Michel Pigeon, Bures sur Yvette, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 31, 1982, Ser. No. 413,517

Claims priority, application France, Sep. 14, 1981, 81 17312

Int. Cl.[4] G01N *27/72*; G01R *33/12*

U.S. Cl. 324—225 **14 Claims**



1. A device for inspecting the surface of a member by means of an eddy current transducer incorporating at least one eddy current probe and supplying a signal representing the state of said surface, wherein said device comprises means for scanning only the surface to be inspected by said transducer along a given path, means for sampling the values of said signal corresponding to elementary measurement zones of said surface separated by a given acquisition spacing, means for storing the sampled values of the signals supplied by the transducer, and means for restoring in a given order independent of said path and at a given speed a series of second signals, each of said second signals having a value deduced only from the sampled value(s) corresponding to at least one adjacent zone(s) of the surface, said series of second signals simulating an inspection of the surface which differs from the real scanning performed by said means for scanning only the surface.

4,555,665

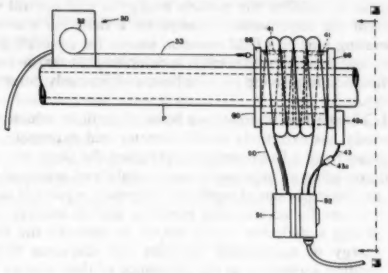
MAGNETIC FLUX METHOD FOR MEASURING TUBULAR WALL THICKNESS

Roderic K. Stanley; Marvin Milewits; Robert C. Knauer, Jr., and James E. Bradfield, all of Houston, Tex., assignors to PA Incorporated, Houston, Tex.

Filed Aug. 4, 1982, Ser. No. 405,203

Int. Cl.[4] G01B *7/10*; G01R *33/12*

U.S. Cl. 324—229 **12 Claims**



1. A method of inspecting a length of ferromagnetic pipe to determine the average wall thickness of the pipe as a function of the axial position along the pipe, comprising the steps of:

disposing a multi-turn encircling saturating coil in surrounding relationship to the pipe;

producing a value of magnetic flux entending longitudinally through a portion of the pipe by applying a current to the encircling coil;

disposing a voltage generating means in surrounding relationship to the pipe;

moving the saturating coil and the voltage generating means relative to the pipe at a varying speed;

integrating the voltage generated in the voltage generating means; and

correlating the integrated voltage to the average thickness of the pipe as a function of axial length.

4,555,666

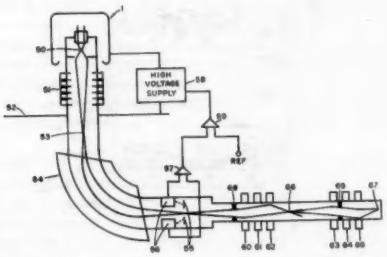
ENERGY-STABLE ACCELERATOR WITH NEEDLE-LIKE SOURCE AND FOCUSED PARTICLE BEAM

Frederick W. Martin, Colebrook Rd., North Stratford, N.H. 03590

Continuation of Ser. No. 25,027, Mar. 29, 1979, abandoned. This application May 19, 1982, Ser. No. 379,736

Int. Cl.[4] H01J *23/00, 23/34*

U.S. Cl. 326—233 **11 Claims**



1. An improved energy stabilized accelerator for producing beams of particles comprising a particle source, a means for accelerating particles, and an analyzer comprising a deflector which serves to measure the kinetic energy of accelerated

particles and disperses them in position according to the difference of their energy from an undeviated central value, a pair of slits positioned at the focal point of said analyzer, a corresponding pair of means for producing electronic signals proportional to the current or pulse rate of particles which strike said slits, and electronic circuitry which produces an output signal indicating deviation of the beam energy from the undeviated, central value of energy specified by said analyzer, the output signal of which analyzer is subtracted electronically from a reference signal and fed back to the accelerating means in order to stabilize the particle energy at said central value, wherein the improvement comprises a field ion source for generating ions or a field emission source for generating electrons, and wherein said source, accelerating means, and analyzer function to provide particle beams of precisely determined energy.

11. The method of creating a beam of particles which simultaneously has extremely small diameter and extremely small deviation from a fixed energy comprising the steps of

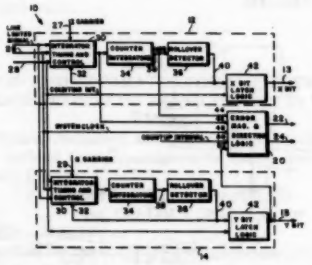
(a) providing an improved, energy-stabilized accelerator for producing beams of particles comprising a particle source, a means for accelerating particles, and an analyzer comprising a deflector which serves to measure the kinetic energy of accelerated particles and disperses them in position according to the difference of their energy from an undeviated central value, a pair of slits positioned at the focal point of said analyzer, a corresponding pair of means for producing electronic signals proportional to the current or pulse rate of particles which strike said slits, and electronic circuitry which produces an output signal indicating deviation of the beam energy from the undeviated, central value of energy specified by said analyzer, the output signal of which analyzer is subtracted electronically from a reference signal and fed back to the accelerating means in order to stabilize the particle energy at said central value, wherein the improvement comprises a field ion source for generating ions or a field emission source for generating electrons, and wherein said source, accelerating means, and analyzer function to provide particle beams of precisely determined energy, and

(b) using the particle beam emergent from said improved accelerator.

4,555,667
SYNCHRONOUS DIGITAL QPSK DEMODULATOR WITH CARRIER ERROR CORRECTION

John R. Cressey, College Pk., and Dennis C. Meneely, Bowie, both of Md., assignors to Rixon, Inc., Silver Spring, Md.

Filed Sep. 26, 1983, Ser. No. 536,140
Int. Cl.[4] H03D *3/18, 3/00, 3/04;* H03K *9/04*
U.S. Cl. 329—50 **30 Claims**



1. In a synchronous digital demodulator for a quadri-phase shift key system including

decoding means for decoding data represented by phase shifts of a received signal for successive baud intervals, and

error correcting means for correcting phase errors between a reconstructed carrier and a received phase modulated carrier of the received signals, the improvement comprising

integrator means operable both for detecting said phase shift data and for correcting said phase errors

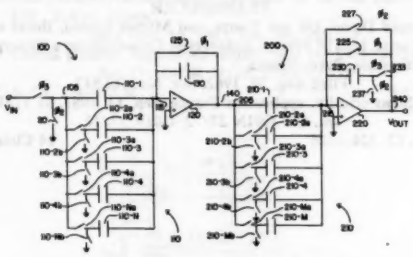
wherein said integrator means comprises counter means operable during a first, integrating, interval of said baud interval for counting a clocking signal and for producing a first signal indicative of data received during said baud interval,

said counter means being further operable in a second, error detecting, interval for counting a clocking signal and for producing a second signal indicative of phase error between said received phase modulator carrier and said reconstructive carrier.

4,555,668
GAIN AMPLIFIER

Roubik Gregorian, and Bahram Fotouhi, both of San Jose, Calif., assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed Oct. 14, 1983, Ser. No. 542,228
Int. Cl.[4] H03F *1/02*
U.S. Cl. 330—9 **10 Claims**



9. A gain amplifier comprising at least a first gain stage having a first gain factor and a second gain stage having a second gain factor, wherein each said gain stage comprises:

an input lead for receiving an input signal to the amplified;

an operational amplifier having an inverting input lead, a noninverting input lead connected to a reference voltage, and an output lead;

a feedback capacitor having a first plate connected to said inverting input lead and a second plate connected to said output lead of said operational amplifier;

input capacitor means connected between said input lead and said inverting input lead of said operational amplifier;

feedback initialization switch means connected between said inverting input lead and said output lead of said operational amplifier,

and wherein in said second gain stage, said feedback initialization switch means closes during a period of time when the feedback initialization switch means of said first gain stage closes, said feedback initialization switch means of said second gain stage remaining closed for a period of time after the feedback initialization switch means of said first gain stage opens, the feedback initialization switch means of said second gain stage opening after said period of time, and wherein said second gain stage further comprises:

second switch means connected between said second plate of said feedback capacitor and said output lead of said operational amplifier; and

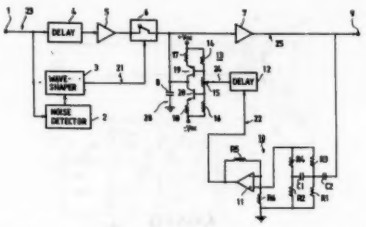
third switch means connected between said second plate of said feedback capacitor and said reference voltage, wherein said output lead of said operational amplifier of said first gain stage is connected to said input lead of said second gain stage.

4,555,669

NOISE REDUCTION BY LINEAR INTERPOLATION USING A SINGLE SAMPLE-AND-HOLD CIRCUIT

Yasuomi Namiki, Yokohama, Japan, assignor to Victor Company of Japan, Yokohama, Japan

Filed Jul. 20, 1984, Ser. No. 632,875
Claims priority, application Japan, Jul. 21, 1983, 58-133128; Aug. 25, 1983, 58-155668
Int. Cl.[4] H03F *1/26*
U.S. Cl. 330—149 6 Claims



1. A noise reduction circuit having an input terminal to which an information signal is applied and an output terminal, comprising:

means connected to said input terminal for detecting a noise impulse introduced in said information signal and generating therefrom a sampling pulse time-coincident with the portion of the signal affected by the impulse;

a sample-and-hold circuit connected between said input and output terminals, the sample-and-hold circuit including a capacitor and a switch for passing said information signal to said output terminal in the absence of said sampling pulse;

a slope detector connected to be responsive to a voltage developed in said capacitor for generating a voltage representative of the rate of variation of the capacitor voltage; and

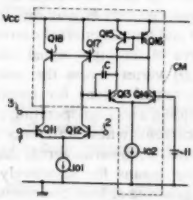
a voltage-to-current converter connected between the output of said slope detector and said capacitor for converting said voltage to a corresponding current and injecting said current to said capacitor when the rate of variation is positive and draining said current from said capacitor when said rate is negative.

4,555,670

DIFFERENTIAL AMPLIFIER

Tatsuo Tanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Nov. 8, 1984, Ser. No. 669,330
Claims priority, application Japan, Nov. 30, 1983, 58-225726
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—252 9 Claims



1. A differential amplifier comprising:

first and second input terminals;

an output terminal;

a first differential amplifying circuit comprising first and second transistors of a first polarity type, the bases of the first and second transistors being connected to said first and second input terminals, respectively;

a current source connected to said first differential amplifying circuit and a first predetermined potential;

a second differential amplifying circuit comprising third and fourth transistors of said first polarity type, the base of the third transistor constituting an inverting input terminal and being connected to the collector of said second transistor, and the base of the fourth transistor constituting a noninverting input terminal and being connected to a bias potential;

a load circuit for said second differential amplifying circuit;

a fifth transistor of a second polarity type forming a collector load for said second transistor, the base of the fifth transistor being connected to the collector of said fourth transistor; and

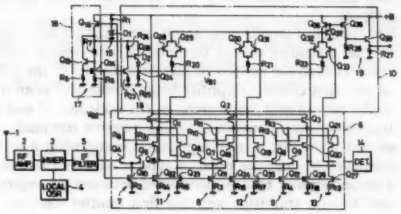
a sixth transistor of said second polarity type for forming a collector load for said first transistor, the base of the sixth transistor being connected to the base of said fifth transistor.

4,555,671

CIRCUIT FOR DRIVING A SIGNAL METER FOR A RECEIVER

Tatsuo Numata, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,865
Claims priority, application Japan, Feb. 2, 1982, 57-15197
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—252 7 Claims



1. A circuit for driving a signal meter in a receiver of the type having an intermediate frequency (IF) amplifier for amplifying an IF input signal, said IF amplifier having a d.c. voltage output in the absence of said IF input signal, said circuit comprising at least one control terminal and at least one controlled terminal and controlling the signal at its controlled terminal in accordance with a control signal applied to its control terminal, means for driving a signal for driving said signal meter in accordance with the signal at said at least one controlled terminal, means for providing said amplifier output to said at least one control terminal, and bias means for biasing an active element circuit with a first bias voltage having a predetermined difference with respect to said d.c. voltage output;

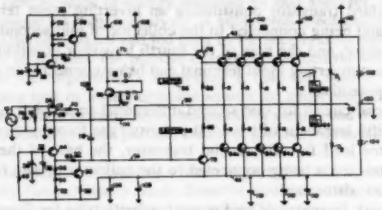
wherein said amplifier is a differential amplifier having at least first and second differential outputs, and

said one active element circuit includes at least one pair of active elements, each active element circuit being associated with a respective first and second pair of differential outputs and each said active element circuit having control and controlled terminals, corresponding controlled terminals of said active elements being coupled together and said first and second differential outputs of said differential amplifier being applied to said control terminals of respective active elements.

4,555,672
HIGH-FIDELITY AUDIO FREQUENCY AMPLIFIER

Brahm R. Segal, 4265 Carlton Ave., Montreal, Quebec, Canada

Filed Nov. 17, 1983, Ser. No. 552,818
Int. Cl.[4] H03F 3/30
U.S. Cl. 330—255 9 Claims



8. A high frequency audio frequency amplifier comprising:

an input amplifier having an inverting input, a non-inverting input, a positive bias port, a negative bias port and an output, the non-inverting input being a signal input;

a positive potential bias source having a reference terminal and a positive terminal;

a negative potential bias source having a negative terminal and a reference terminal common with said reference terminal of said positive potential bias source;

a first current amplifier having an input coupled between said positive bias terminal and said positive bias port of said input amplifier and having a first current amplified output;

a second current amplifier having an input coupled between said negative bias terminal and said negative bias port of said input amplifier and having a second current amplified output;

a first transistor amplifying circuit comprising a first transistor, an amplifier output terminal, a first emitter resistor connected to the emitter of said first transistor, the output of said first current amplifier being connected as an input to the base of said first transistor, the collector of said first transistor being connected to said positive terminal;

a second transistor amplifying circuit comprising a second transistor of opposite polarity type to said first transistor, a second emitter resistor connected between the emitter of said second transistor and the first emitter resistor, the output of said second current amplifier being connected as an input to the base of said second transistor;

a first power amplifier comprising at least one third transistor having its input connected to the emitter of said first transistor and its collector connected to said positive terminal, and a third emitter resistor connected between the emitter of said third transistor and said amplifier output terminal;

a second power amplifier comprising at least one fourth transistor of opposite polarity type to said third transistor and having its input connected to the emitter of said second transistor and having its collector connected to said negative terminal, and a fourth emitter resistor connected between the emitter of said fourth transistor and said amplifier output terminal, the combined outputs of said first and second power amplifiers appearing between said amplifier output terminal and said reference terminal;

a temperature compensating current control comprising a fifth transistor connected in emitter-to-collector configuration and between the bases of said first and second transistors, and current conducting means connected from the base of one of said first and second transistors to the base of said fifth transistor;

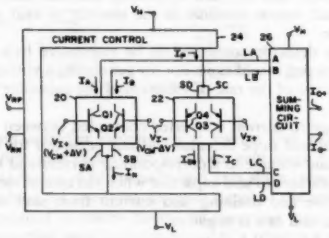
a negative feedback circuit comprising a feedback resistor connected between said amplifier output terminal and said inverting input of said input amplifier, a first capacitor connected between the base of said first transistor and the inverting input of said input amplifier, and a second capacitor connected between the base of said second transistor and the inverting input of said input amplifier; and

a plurality of capacitors, including a first plurality of capacitors in turn including capacitors of different capacitances connected between said positive terminal and said reference terminal, and a second plurality of capacitors, including capacitors of different capacitances connected between said negative terminal and said reference terminal.

4,555,673
DIFFERENTIAL AMPLIFIER WITH RAIL-TO-RAIL INPUT CAPABILITY AND CONTROLLED TRANSCONDUCTANCE

Johan H. Huijsing, Den Hoorn ZH, Netherlands, and Rudy J. van de Plassche, Cupertino, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Apr. 19, 1984, Ser. No. 602,231
Int. Cl.[4] H03F 3/45
U.S. Cl. 330—258 24 Claims



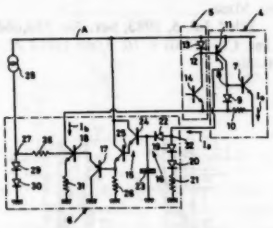
1. An amplifier operable between first and second supply voltages which define a supply range consisting of (a) a first end range extending from the first supply voltage to a first specified voltage between the supply voltages, (b) a middle range extending from the first specified voltage to a second specified voltage between the first specified voltage and the second supply voltage, and (c) a second end range extending from the second specified voltage to the second supply voltage, the amplifier having: first differential means for amplifying a differential input signal by largely dividing a first operating current into first and second internal currents whose difference is representative of the input signal when its common-mode voltage (V_{CM}) varies across the middle and second ranges; second differential means for amplifying the input signal by largely dividing a second operating current into third and fourth internal currents whose difference is representative of the input signal when V_{CM} varies across the first and middle ranges; and summing means for selectively combining the internal currents to generate at least one output signal; characterized by control means for providing amplifier supply current to generate the operating currents and for suitably steering at least part of the supply current away from at least one of the differential means when V_{CM} is in at least one part of the supply range so as to control the operating currents at values dependent on the steering of the supply current.

4,555,674

POWER AUDIO-AMPLIFIER WITH AUTOMATIC ADJUSTMENT OF THE BIAS CURRENT ABSORBED BY THE FINAL STAGE

Sergio Palara, Bareggio, and Aldo Torazzina, Monza, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Aug. 15, 1983, Ser. No. 523,052
Claims priority, application Italy, Sep. 24, 1982, 23443 A/82
Int. Cl.[4] H03F 3/30
U.S. Cl. 330—267 6 Claims



1. A power audio amplifier, comprising:

at least one amplifying stage;

a final stage coupled to said at least one amplifying stage and having a bias current and an output adapted to provide an output current to a load having a load and a no-load state; and

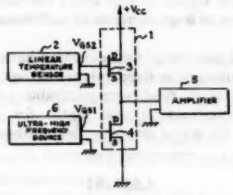
current control means, coupled to said final stage, for automatically changing said bias current between a low and a higher value when said load changes between said no-load and said load state, respectively.

4,555,675

DEVICE FOR COMPENSATING TEMPERATURE DRIFTS OF THE GAIN OF AN ULTRA-HIGH FREQUENCY ELECTRIC SIGNAL AMPLIFIER

Monique Blanchandin, Neuilly sur Seine; Roland Girardat, Andresy, and Jean-Michel Vanestrenvord, Levallois-Perret, all of France, assignors to Thomson CSF, Paris, France

Filed Jan. 10, 1984, Ser. No. 569,711
Claims priority, application France, Jan. 21, 1983, 83 00914
Int. Cl.[4] H03F 3/04
U.S. Cl. 330—289 8 Claims



1. A device to compensate for temperature drift in the gain of an amplifier which amplifies ultra-high frequency signals generated by an ultra-high frequency signal source, comprising:

a bi-gate field effect transistor with a gain and having an output adapted for connection to said amplifier, a first input adapted for connection to said ultra-high frequency source, and a second input; and

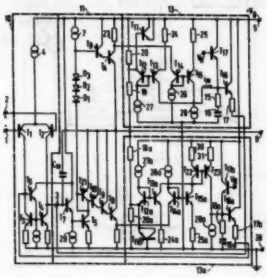
linear temperature sensor means, coupled to said bi-gate transistor second input, for controlling said bi-gate transistor gain as a function of temperature variations.

4,555,676

DUAL-SECTION AMPLIFIER ARRANGEMENT HAVING A PROTECTION CIRCUIT

Rudy J. van de Plassche, Sunnyvale, Calif., and Eise C. Dijkmans, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1984, Ser. No. 569,648
Claims priority, application Netherlands, Jan. 11, 1983, 8300078
Int. Cl.[4] H03F 1/34; H02H 7/20
U.S. Cl. 330—298 6 Claims



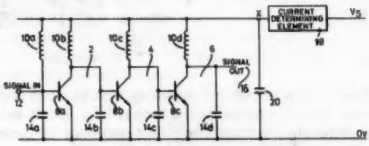
1. An amplifier arrangement comprising a first amplifier section having an input and an output, a second amplifier section having an input which is connected to the output of the first amplifier section, an output, at least a first output transistor and a first driver transistor which drives said output transistor, and a protection circuit for overload protection of said output transistor, characterized in that the protection circuit forms a loop around the second amplifier section, acts on the input to the second amplifier section, and has a frequency response a portion of which falls off with increasing frequency within the frequency range of the amplifier arrangement.

4,555,677

F.M. AMPLIFIER FOR USE IN I.F. STAGES

Graham E. Beesley, Winchester, England, assignor to Sinclair Research Limited, Cambridge, England

Filed Apr. 3, 1984, Ser. No. 596,270
Claims priority, application United Kingdom, Apr. 22, 1983, 8311071
Int. Cl.[4] H03F 3/04
U.S. Cl. 330—302 5 Claims



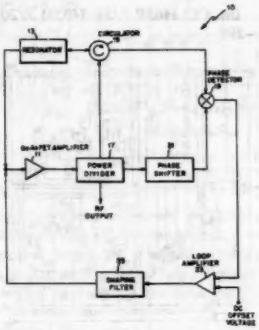
1. An amplifier comprising a plurality of direct-coupled common emitter bipolar transistor amplifier stages connected in cascade and a biassing means comprising a pair of common voltage rails for said stages, each stage having an inductive load connected between the collector of its respective transistor and one of the common voltage rails and the emitter of its respective transistor being directly-coupled to the other common voltage rail.

4,555,678

MICROWAVE OSCILLATOR

Zvi Galani, Bedford; Richard W. Laton, Lexington; Raymond C. Waterman, Jr., Westford, and Robert DiBiase, Carlisle, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 21, 1983, Ser. No. 554,012
Int. Cl.[4] H03B 5/22
U.S. Cl. 331—1 A **2 Claims**



1. In a microwave oscillator using a GaAs FET as the active element, such oscillator including a resonator with a high Q to provide positive feedback and to reduce FM noise, the improvement comprising:

(a) phase detector means, responsive to signals out of the GaAs FET shifted by 90° and to a portion of the positive feedback signals, for providing signals representative of low frequency noise arising within the GaAs FET; and

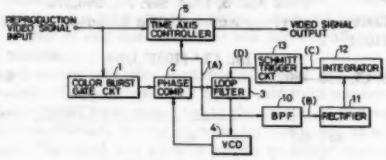
(b) means for feeding back the signals out of the phase detector to degenerate such low frequency noise.

4,555,679

DETECTION CIRCUIT FOR DETECTING SYNCHRONOUS AND ASYNCHRONOUS STATES IN A PHASE-LOCKED LOOP CIRCUIT

Hitoshi Katsuyama, Saitama, Japan, assignor to Pioneer Video Corporation, Yamanashi, Japan

Filed May 20, 1983, Ser. No. 496,733
Claims priority, application Japan, May 20, 1982, 57-85598
Int. Cl.[4] H03L 7/00, 7/10; H04N 9/46
U.S. Cl. 331—17 **14 Claims**



1. A detection circuit for detecting synchronous and asynchronous states is a phase-locked loop (PLL) circuit, said PLL circuit including a voltage controlled oscillator for generating an oscillation signal, a phase comparator for comparing said oscillation signal to an input signal, said phase comparator providing an output which includes a first frequency component when said PLL circuit is in said synchronous state and a second frequency component when said PLL circuit is in an asynchronous state, and a loop filter connected between said phase comparator and said voltage controlled oscillator for providing a control signal applied to said voltage controlled oscillator, said detection circuit comprising:

processing means for generating a processed signal from said phase comparator output by removing said first frequency component from said phase comparator output; and

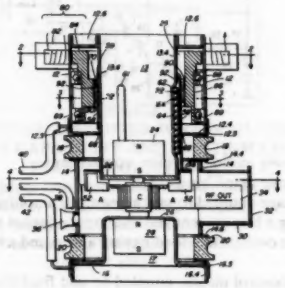
detection signal generating means responsive to said processed signal for generating a detection signal indicating the synchronous or asynchronous state of said PLL circuit.

4,555,680

MAGNETRON TUNED PROGRAMMABLY USING STEP MOTOR

John E. Burr, Wenham, Mass., assignor to M/A-COM, Inc., Burlington, Mass.

Filed Jul. 5, 1983, Ser. No. 510,664
Int. Cl.[4] H03B 9/10, 5/40; H01J 25/50
U.S. Cl. 331—86 **5 Claims**



1. A resonant-cavity type electron tube having a mechanically-operable tuning means associated with the resonant-cavity structure within an evacuable envelope, means within said envelope for adusting said tuning means relative to said resonant-cavity structure so as to tune the frequency of resonance of said structure step-wise in accordance with a predetermined program, said adjusting means comprising a step motor having a stator and armature, said envelope having a portion extending between said stator and said armature for enclosing said armature within the evacuable space containing said tuning means and said resonant-cavity structure, means coupling said armature to said tuning means for altering the position of said tuning means relative to said resonant-cavity structure in fixed relation to the displacement of said armature relative to said stator, means to couple said armature to said stator magnetically through said portion of said envelope, and means to provide electrical signals to said stator for establishing a programmable series of displacements of said armature relative to said stator,

in which said portion of said envelope between said stator and said armature is fixed relative to said stator and includes inserts of readily-magnetizable material located adjacent pole-faces of said stator for enhancing the strength of the stator magnetic field within said envelope.

4,555,681

IMPROVED, LOW-DISTORTION, BROADBAND DIRECTIONAL COUPLER FORMED BY MULTIPLE SERIES TRANSFORMERS

Thomas S. Dominick, Glen Burnie, and Roy G. Anderson, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1984, Ser. No. 636,774
Int. Cl.[4] H03H 7/00
U.S. Cl. 333—112 **6 Claims**

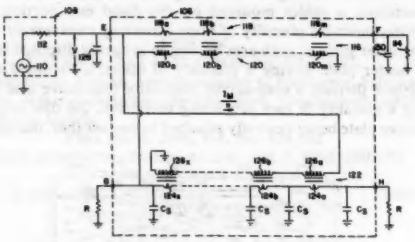
1. A high frequency directional coupler, comprising

(a) input, output, reflected, and incident ports;

(b) current transformer means including at least one primary winding connected between said input and output ports

and at least one secondary winding coupled with said current transformer primary winding and connected between said reflected port and ground; and

(c) voltage transformer means including a plurality of series-connected primary windings connected between said



reflected port and said incident port, and a plurality of series-connected secondary windings coupled with said voltage transformer primary windings, respectively, and connected between said input port and ground, whereby intermodulation distortion of the coupler is improved.

4,555,682

MECHANICAL FILTER

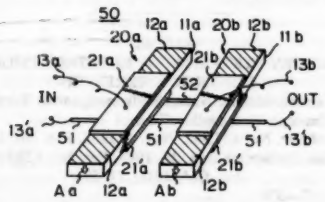
Takashi Gounji, Yokohama; Teruo Kawatsu, Kawasaki; Yoshihiko Kasai, Yokohama, and Chikao Takeuchi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 23, 1984, Ser. No. 582,768

Claims priority, application Japan, Mar. 2, 1983, 58-032936; Mar. 2, 1983, 58-032937; Mar. 4, 1983, 58-035302

Int. Cl.⁴ H03H *9/50, 9/54, 9/13*

U.S. Cl. 333—189 **38 Claims**



1. A mechanical filter having input and output sides comprising:

an input side piezoelectric ceramic member and an output side piezoelectric ceramic member, each of said piezoelectric ceramic members having a center, top and bottom surfaces, a thickness in the direction between said top and bottom surfaces, a frequency temperature characteristic, a polarization in the direction of said thickness and a longitudinal vibrational mode;

top and bottom constant modulus alloy members separately mounted on said top and bottom surfaces of said piezoelectric ceramic members, respectively, each pair of top and bottom constant modulus alloy members having the same configuration, a frequency-temperature characteristic opposite to said frequency-temperature characteristic of the piezoelectric ceramic member mounted therebetween, and centers, said centers of said top and bottom piezoelectric ceramic members being aligned with the center of the piezoelectric ceramic member mounted therebetween; and

at least one coupler connected between either said top or said bottom side constant modulus alloy members mounted on said input and output side piezoelectric ceramic members.

4,555,683

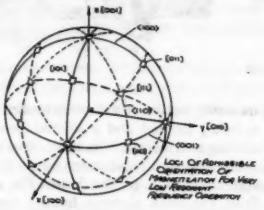
MAGNETICALLY TUNABLE RESONATORS AND TUNABLE DEVICES SUCH AS FILTERS AND RESONANT CIRCUITS FOR OSCILLATORS USING MAGNETICALLY TUNED RESONATORS

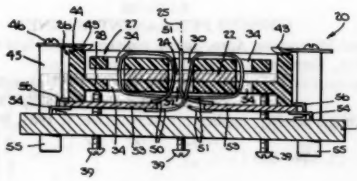
Gunter U. Sorger, Menlo Park, and Dan Raicu, Sunnyvale, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 30, 1984, Ser. No. 574,847

Int. Cl.⁴ H01P *1/217, 7/00*

U.S. Cl. 333—202 **26 Claims**





1. A magnetically tunable resonator comprising a body and means for applying a dc magnetic field to the body, the body being generally flat and being generally rotationally symmetrical with respect to an axis of rotation, the body comprising a single crystal ferrimagnetic material and being configured so that said axis of rotation is oriented in a specific manner with respect to the lattice of said single crystal ferrimagnetic material, the orientation of said axis with respect to said lattice being parallel to a (100) plane for a material with a negative anisotropy, and parallel to a (110) plane inside the acute angle formed by two [111] axes for a material with a positive anisotropy, the dc magnetic field applying means and the body being oriented with respect to each other so that the dc magnetic field applying means applies the dc magnetic field to the body parallel to said axis of rotation, the body having a variable resonance frequency selectable by the dc magnetic field, and the dc magnetic field applying means being adjustable so as to apply a dc magnetic field to the body to cause it to resonate at a selected resonance frequency.

4,555,684

MOTOR STARTING DEVICE

Douglas J. Slack, Smithfield Plains, Australia, assignor to Texas Instruments Incorporated, Dallas, Tex.

PCT No. PCT/AU83/00181, § 371 Date Aug. 9, 1984, § 102(e) Date Aug. 9, 1984, PCT Pub. No. WO84/02425, PCT Pub. Date Jun. 21, 1984

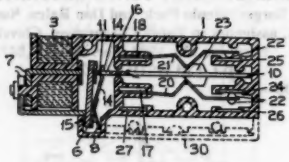
PCT Filed Dec. 9, 1983, Ser. No. 639,106

Int. Cl.⁴ H01H *7/06, 43/02*

U.S. Cl. 335—66 **16 Claims**

1. A motor starting device adapted to de-energize a start winding, the device having a housing supporting an electro-

magnetic coil and switch means, characterized by a movable latch member connected between a keeper means of the electromagnetic coil and the switch means, the keeper having a portion movable toward and away from the electromagnetic coil and being operatively connected to the latch member to move the latch member, and a current carrying bimetallic strip mounted in the housing, the bimetallic strip having at least a



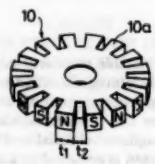
portion movable between a first unheated position when no current is being carried and a second heated position when current is being carried, the bimetallic strip adapted to hold the latch member against displacement by the keeper means of the electromagnetic coil until the bimetallic strip is heated by current flow, the latch member having means to actuate the switching means upon selected movement of the latch member.

4,555,685

FORMED PERMANENT MAGNET

Ryozi Maruyama, Ageo, Japan, assignor to Dai-Ichi Seiko Co., Ltd., Kawaguchi, Japan

Continuation of Ser. No. 446,419, Dec. 2, 1982, abandoned. This application Nov. 29, 1984, Ser. No. 675,473
Claims priority, application Japan, Dec. 9, 1981, 56-196993
Int. Cl.⁴ H01F *7/02*
U.S. Cl. 335—303 **12 Claims**



1. A formed permanent magnet used as a sensor comprising a base having a plurality of gaps with a predetermined width formed between portions of said gaps serving to form magnetic poles and having a predetermined width, said base being injection molded with a material including a synthetic resin mixed with a magnetic material, said portions between said gaps being magnetized as N poles and S poles, alternately.

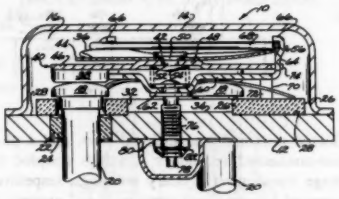
4,555,686

SNAP-ACTING THERMOSTATIC SWITCH ASSEMBLY

Radi Pejouhy, Marshfield, and Wilfred W. Cardin, Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1984, Ser. No. 614,621
Int. Cl.⁴ H01H *61/01, 71/16*
U.S. Cl. 337—102 **11 Claims**

1. A thermostatic switch assembly comprising a metallic base member and a cover attached to the base member forming therewith a switch compartment, the base member having an inner surface, a plurality of apertures extending through the base member, a terminal pin extending through each aperture in electrical insulating relationship with the base member by glass sealing means, an electrical insulator disposed on the inner surface, the insulator having an aperture therethrough for each terminal pin, each terminal pin having an end extending through a respective insulator aperture and disposed in the switch compartment spaced a selected distance from the inner surface, a stationary contact mounted on the end of each terminal pin, a movable contact assembly mounted in the compartment comprising on elongated element mounted on the base member and having a distal end portion disposed in the compartment, a spider mounted on the distal end portion, the spider having a plurality of arms extending transversely over the inner surface, each arm having an inwardly disposed hook, a heater plate having a plurality of contacts mounted on a surface thereof, a snap-acting, thermally responsive disc having a plurality of ears projecting therefrom, the disc and the heater plate being centrally attached to one another, the ears of



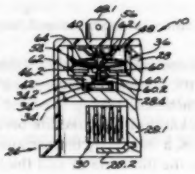
the disc each having a bifurcating slot with a respective spider hook received through the slot, a wire retainer received in each hook between the hook and its respective ears of the disc to mount the heater plate and the disc to the spider, the disc adapted to snap from a first configuration with the contacts on the heater plate in engagement with respective stationary contacts to a second configuration with the contacts on the heater plate out of engagement with the stationary contacts, characterized in that the electrical insulator is loosely received on the inner surface of the base member and a spring member is disposed between the insulator and the spider to bias the insulator firmly against the base member and to stabilize the position of the movable contact assembly.

4,555,687

FUEL SUPPLY SYSTEM WITH ELECTRIC CHOKE AND CONTROL THEREFOR

Hidde Walstra, Almelo, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 437,982, Nov. 1, 1982, Pat. No. 4,496,496. This application Jun. 25, 1984, Ser. No. 620,595
Int. Cl.⁴ H01H *37/52*
U.S. Cl. 337—370 **3 Claims**



1. A control device comprising movable and complementary contact means connectable between a power source and a load for energizing the load when the contact means are engaged and for deenergizing the load when the contact means are separated, and a pair of dished bimetallic elements which are movable with snap action from original dished configurations to inverted dished configurations in response to respective selected increases in temperature, the elements being electrically insulated from at least one of said contact means and at least one of the elements having an aperture therein, and the pair of bimetallic elements being disposed between the contact means to hold the contact means separated at least when the

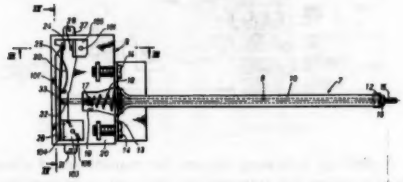
pair of dished bimetallic elements has one combination of said dished configurations and at least said one of the dished bimetallic elements having said aperture therein permitting the contact means to be engaged through the aperture at least when the pair of dished bimetallic elements has a second combination of said dished configurations.

4,555,688

THERMOSTAT FOR COOKING UTENSIL

Helmut Bayer, Vienna, Austria, assignor to Electrovac, Fabrikation elektrotechnischer Spezialartikel Gesellschaft mbH, Vienna, Austria

Filed Jul. 6, 1984, Ser. No. 628,532
Claims priority, application Austria, Jul. 7, 1983, 2507/83
Int. Cl.[4] H05B *1/02*
U.S. Cl. 337—394 **9 Claims**



1. A device for regulating temperature of radiation and contact heating bodies and electrical cooking apparatus in combination with cooking surfaces consisting of metal, glass ceramics and the like, in which at least one temperature sensor and switch system are provided in order to regulate the temperature of the heating body between the heating body and the cooking surface, said sensor having a rod of high thermal expansion which is disposed in a tube made of low thermal expansion, the switch system being enclosed within a switch housing, one end of the rod being in communication with the switch system which serves to regulate the temperature of the heating body, one end of the tube resting against a side wall of the switch housing, the side wall being oriented approximately perpendicular to the rod, a second end of the rod and a second end of the tube being joined together at a location distant from the switch housing to form the sensor, the improvement wherein

the end of the tube which rests against the side wall has a funnel-shaped enlargement in diameter and the side wall has a spherical bulge which extends into the enlargement of the diameter to contact directly the material of the tube so as to form a joint in this region;

the bulge having a hole for entry of the one end of the rod into the switch housing, the device including spring means connecting between an interior side of said bulge and the one end of the rod for securing the sensor to the housing, and wherein electrically conducting elements of the switch system are electrically insulated from said sensor.

4,555,689

ELEVATOR SYSTEM WITH LAMP STATUS AND MALFUNCTION MONITORING

Michael J. Brick, Wallingford, Conn., and Linus R. Dirnberger, Randolph, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 30, 1983, Ser. No. 527,919
Int. Cl.[4] B66B *3/00*
U.S. Cl. 340—19 R **5 Claims**

1. An elevator system, comprising:

a building having a plurality of floors,

an elevator car mounted for movement in said building,

car controller means for directing said elevator car to serve floors of said building,

lamp means at each floor served by said elevator car, with said lamp means including at least one lamp,

said car controller means preparing and issuing illumination commands for selectively controlling the illumination status of the lamp means,

processor means at each floor served by said elevator car,

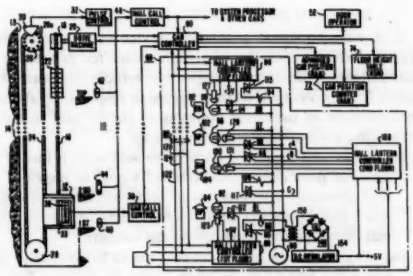
and communication means having first, second and third conductors, with said third conductor being common to the first and second conductors, said car controller means selectively addressing and communicating illumination commands to each of said processor means via said first communication conductor,

each of said processor means including means for implementing illumination commands for its associated lamps, including means for energizing and deenergizing said lamps,

each of said processor means further including means for testing the results of each implementation, with said means including detector means, comparator means, and memory means,

said detector means determining the actual illumination status of each lamp associated with the processor,

said comparator means comprising the actual illumination status of each associated lamp with the commanded status, to detect lamp malfunctions,



said processor memory means storing malfunction indications detected by said comparator means,

each of said processor means including means for preparing and transmitting response messages to said car controller via said second communication conductor, with said response messages including an acknowledgement when an illumination command has been actually implemented, as determined by said detector means and said comparator means, and a malfunction indication when detected by said detector means and said comparator means,

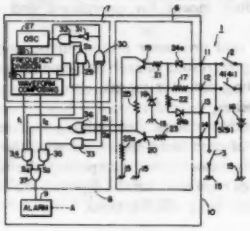
said car controller means including memory means for maintaining a lamp status table and a lamp malfunction table in response to said response messages, with said car controller means being responsive to the status of the elevator system, said lamp status table, and said lamp malfunction table when preparing commands for the processor means, preparing an energizing command for a lamp only in the absence of a stored malfunction indication relative to the lamp,

said first, second and third conductors handling all of the communications between said car controller means and said processor means, regardless of the number of said processor means.

4,555,690
WARNING SIGNAL GENERATING DEVICE FOR VEHICLE

Yoneharu Fukushima, and Kiyoshi Wakai, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Dec. 30, 1981, Ser. No. 335,492
Claims priority, application Japan, Dec. 30, 1980, 55-188149
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—52 F 12 Claims



1. A warning signal generating device for a vehicle of the type including a plurality of switch means for providing outputs indicating the status of respective vehicle components and means for generating a warning signal in response to abnormal combinations of indicated component status, said means for generating a warning signal comprising:

control circuit means responsive to said switch means outputs for providing a first control signal in response to a first abnormal combination of said switch means outputs and a second control signal in response to a second abnormal combination of switch means outputs;

alarm signal generating means responsive to said first control signal for providing an alarm drive signal of a first frequency and responsive to said second control signal for providing an alarm drive signal of a second frequency comprising;

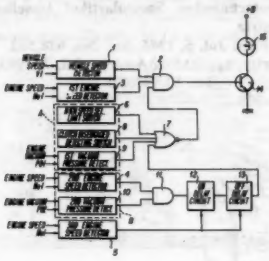
alarm means responsive to said alarm drive signals for providing different alarm indications in response to said two drive signals, said alarm signal generating means comprising; oscillation signal generating means responsive to either of said control signals for simultaneously generating said first and second frequency signals comprising; oscillator means responsive to either of said control signals for generating an oscillation signal, and means for including a frequency division means for receiving and frequency dividing said oscillation signal into a plurality of frequency divided signals, for deriving said first and second frequency signals from said oscillation signal; gate circuit means responsive to said first control signal for passing said first frequency signal to said alarm means and responsive to said second control signal for passing said second frequency signal to said alarm means; and

wherein said oscillation signal generating means further comprises timing means responsive to an output from said frequency division means for terminating the generation of said first and second alarm drive signals after a predetermined period of time, said timing means including a counter for counting a timing signal derived from said oscillation signal.

4,555,691
SHIFT INDICATING SYSTEM FOR SPEED CHANGE GEARS OF A MANUAL TRANSMISSION

Takefumi Hosaka, Asaka; Takeshi Imai, Tokyo, and Takaya Senzaki, Iruma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,710
Claims priority, application Japan, Dec. 4, 1981, 56-196092
Int. Cl.[4] G09B *9/04*; B60Q *1/26*
U.S. Cl. 340—52 R 8 Claims



1. A shift-up indicating system for manual speed change gears of a automobile transmission, said system comprising:

(a) car speed detector means for detecting a vehicle speed condition when the speed of an automobile is greater than a predetermined vehicle speed and for producing an output voltage level indicative of said condition;

(b) engine speed detector means for detecting an engine speed condition when the speed of an engine of said automobile is greater than a predetermined engine speed and for producing an output voltage level indicative of said condition;

(c) circuit means for monitoring the occurrence of at least one predetermined operating condition of said automobile during the occurrence of which said at least one predetermined operating condition an indication to a driver of said automobile of a condition of poor fuel consumption is not required, and for producing an output voltage level when said at least one predetermined operating condition occurs; and

(d) indicator means operably coupled to said car speed detector means, said engine speed detector means and said circuit means, for producing an indication of an operating condition of poor fuel consumption when said output voltage levels of said car speed detector means and said engine speed detector means indicate that the automobile and engine speeds are greater than the respective predetermined vehicle speed and predetermined engine speed and when the output voltage level of said circuit means indicates that none of said at least one predetermined operating condition of said automobile has occurred.

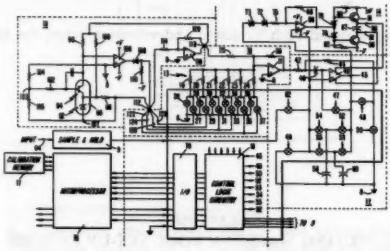
4,555,692
ERROR CORRECTING APPARATUS FOR SYSTEMS SUCH AS ANALOG TO DIGITAL CONVERTERS

Benjamin Eng, Jr., Everett; Peter S. Duryee, Lynnwood, and John M. Anholm, Jr., Snohomish, all of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Nov. 14, 1983, Ser. No. 551,377
Int. Cl.[4] H03K *13/06*
U.S. Cl. 340—347 AD 3 Claims

1. In a recirculation of remainder analog to digital converter having an input terminal for receiving an input analog signal, selectable switch means for generating digital reference signals, offset means for causing said digital reference signals to be offset by a predetermined amount; digital to analog conversion means responsive to said switch means and said offset means for generating analog reference signals representative of said

digital reference signals and amplifier means operable selectively as (a) a comparator to compare the input analog signal with said analog reference signals and generate an indicator signal when said analog input and reference signals have a predetermined relationship, (b) a difference amplifier to amplify a difference between the analog input and analog reference signals to obtain an analog remainder signal to be recirculated, and (c) a comparator to compare the analog recirculated remainder signal with the analog reference signal and generate said indicator signal when said input analog reference and remainder signals have a predetermined relationship; and control means for controlling said switch means to generate said



digital reference signals and to modify the output of said switch means in response to said indicator signals, the digital reference signal corresponding to outputs of said modified switch means, together with the digital reference signals corresponding to said remainder signals, constituting said digital output signal;

error correcting circuitry characterized in that said switch means generates digital reference signals having a predetermined degree of accuracy greater than the required accuracy of an output of said analog to digital converter, and in that successive recirculated remainders overlap, whereby errors in said successive remainders cancel.

4,555,693

MULTIKEY KEYBOARD FOR INPUTTING DATA INTO A COMPUTER

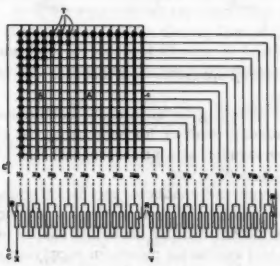
Sherif Danish, Foster City, and Adel Danish, Menlo Park, both of Calif., assignors to Polytel Corp., Sunnyvale, Calif.

Filed Dec. 27, 1982, Ser. No. 453,592

Claims priority, application France, Oct. 27, 1982, 82 17975

Int. Cl.⁴ G06F *3/02*

U.S. Cl. 340—365 S **19 Claims**



1. A multikey keyboard for inputting data into the computer, whose keys place in circuit the point of intersection of a matrix of X rank and Y rank conductors, characterized in that the X rank conductors, on the one hand, and the Y rank conductors, on the other, are respectively connected together by interconnection resistors (R) and to an output X and an output Y of the keyboard, intended to be connected to two analog inputs of the computer, so that the resistance values applied at the input to these latter are representative of the X rank and of Y rank of any key pressed in that the resistance for any key of a given X or Y rank is substantially constant for all keys of the same column or row, respectively, but differ in resistance from column to column or row to row.

4,555,694

DISPLAY DEVICE FOR A VEHICLE

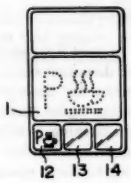
Takayuki Yanagishima, Yokosuka, and Yasutoshi Seko, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 1, 1982, Ser. No. 384,029

Claims priority, application Japan, Jun. 3, 1981, 56-84427

Int. Cl.⁴ G08B *25/00*

U.S. Cl. 340—524 **16 Claims**



1. An automotive vehicle display device for displaying various information according to vehicle driving conditions, comprising:

detector means for detecting driving and/or driver conditions for deriving plural detector signals in response to preselected vehicle driving and/or driver conditions being detected;

a common display for displaying various visual patterns, each corresponding to one of the conditions to be displayed, said common display including a storage for storing said display patterns;

a plurality of individual displays, each displaying one of said display patterns indicative of a corresponding one of said conditions; and

a display controller associated with said common and individual displays for controlling displays thereon, said common display, and one of the display patterns corresponding to the detected notable condition for a predetermined period of time; and said controller operating one of said individual displays to display specific information concerning said notable condition in response to said detector signal as long as the preselected vehicle driving condition is maintained.

4,555,695

FIRE ALARM SYSTEM

Haruchika Machida, and Sadataka Yuchi, both of Sagamihara, Japan, assignors to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,437

Claims priority, application Japan, May 19, 1983, 58-75145[U]; Sep. 20, 1983, 58-173701

Int. Cl.⁴ G08B *1/08*

U.S. Cl. 340—538 **10 Claims**

1. A fire alarm system having a plurality of fire detectors connected in parallel with each other to signal lines leading to a central signal station for detecting a change in the ambient physical phenomena caused by a fire and responding to the station with the detection signal, which system is characterized in that

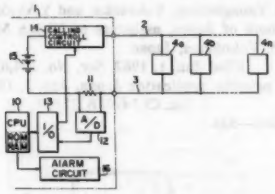
said signal lines connecting to the respective fire detectors are also used as power lines;

each of said fire detectors receives calling clock pulses su-

perposed on a power supply voltage and transmitted from the central signal station through the power/signal lines and returns the detection signal in the mode of current to the signal station; and

said central signal station comprises:

a calling control means which outputs the calling clock pulses by transmitting one calling clock pulse to one fire detector and providing, between the calling clock pulses,



a time for detecting at least a steady-state current and a time for detecting the detection signal current;

a current detecting means for detecting the steady-state current and the detection signal current;

a computing means for obtaining a difference between the steady-state current and the detection signal current; and

an alarm means for giving an alarm upon determination of a fire based on the output value from the computing means.

4,555,696

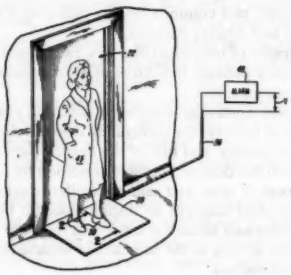
PASSAGEWAY SELECTIVE DETECTOR MECHANISM AND SYSTEM

Donald G. Brown, 4609 Kellogg Ave., Cincinnati, Ohio 45226

Filed Jun. 8, 1983, Ser. No. 502,175

Int. Cl.[4] G08B *13/24*

U.S. Cl. 340—551 **12 Claims**



1. Passageway selective detector mechanism comprising a mat for location in a passageway, the mat including a plurality of magnetically operable electric switches, alarm means, electric circuit means joined to the electric switches and to the alarm means and adapted to be joined to a source of electrical energy for energization of the alarm means by magnetic means positioned adjacent the mat.

4,555,697

TEETH-HELD HEAD TILT ALARM

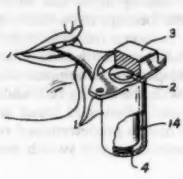
James D. Thackrey, 13852 Dall La., Santa Ana, Calif. 92705

Filed Feb. 17, 1984, Ser. No. 581,075

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—575 **4 Claims**

1. A self-contained drowsiness alarm device of the type in which a tilt switch moving with the head connects a source of electromotive force to a buzzer when the head tilts, wherein the improvement comprises a mouthpiece for holding the device between the user's upper and lower teeth, said buzzer



emitting a signal both by sound and vibration when the head tilts.

4,555,698

DETECTING MACHINE TOOL SET-UP ERRORS

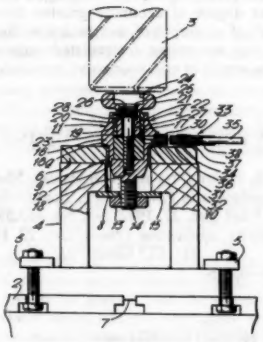
Frederick Clark, and Colin Moore, both of Preston, England, assignors to British Aerospace Public Limited Company, London, England

Filed May 11, 1982, Ser. No. 377,177

Claims priority, application United Kingdom, May 12, 1981, 8114467

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—680 **12 Claims**



1. Set-up checking apparatus for a machine tool, the apparatus comprising:

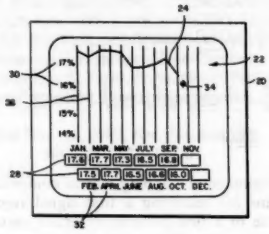
a setting-aid including an electrically conductive member and a mounting member for supporting the electrically conductive member at a predetermined position relative to the machine tool, and

a detector circuit and conductor means for connecting the conductive member of said setting-aid to the detector circuit, the detector circuit including supply means connected to said conductor means for supplying a signal to said setting-aid via the conductor means, first sensor means connected to said conductor means and operable for sensing a change in said signal indicative of disconnection between the detector circuit and the setting-aid, and second sensor means connected to said conductor means and operable for sensing a change in said signal indicative of contact between said conductive member of the setting-aid and a cutting tool of the machine tool.

4,555,699
DATA-ENTRY SYSTEM

Alan L. Citron, Winchester; Thomas W. F. Lindquist, Boston, and William E. Popp, Walpole, all of Mass., assignors to Bancware, Inc., Stoughton, Mass.

Filed Jan. 10, 1983, Ser. No. 456,611
Int. Cl.⁴ G09G *1/00*
U.S. Cl. 340—707 **10 Claims**



1. A data-entry system comprising:

A. a two-axis analog entry device that senses successive locations thereon of a location indicator and generates location signals representing the location in terms of a pair of axis coordinates whereby one may enter on said entry device a graphic representation of a function by positioning the location indicator at successive locations thereon;

B. a two-axis display device operable to display thereon an independent-variable scale and a function scale and to indicate the values of a function of an independent variable for a series of values of the independent variable by generating thereon a graphical representation of the function that represents the values of the independent variable by distance from one axis in accordance with said independent-variable scale and represents the values of the function by distance from the other axis in accordance with said function scale; and

C. control means for operating said display device to display said function and independent-variable scales, for receiving said location signals from said analog entry device, and for responding to the location signals by operating said display device to display said graphical representation and by storing a series of values of the function represented by said graphical representation.

4,555,700
INTERNAL IMAGE AND BIT ARRAY FOR DISPLAY AND PRINTING OF GRAPHICS

Danny B. Convis, Washington Grove; Donald T. Crehan, Gaithersburg, both of Md., and Charles J. Lovell, Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

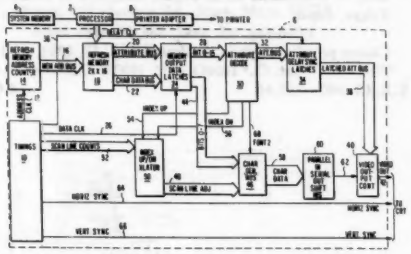
Filed May 11, 1983, Ser. No. 493,677
Int. Cl.⁴ G07G *3/00*
U.S. Cl. 340—721 **4 Claims**

1. In a word processing system having an interactive display terminal and a printer, both said display terminal and said printer being character box devices, the improvement comprising apparatus for displaying alphanumeric and graphic images on said display terminal by character generation and for printing high resolution graphic images on said printer, said apparatus comprising:

first storage means for storing data representative of alphanumeric data and low resolution graphic data in the form of alphanumeric character data and graphic character data, respectively;

second storage means for storing data representative of high resolution printed graphics in the form of a bit array;

means for applying said data representative of said alphanumeric data from said first storage means and data from said second storage means to said printer; and

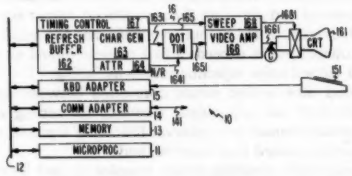


means for applying said data representative of said alphanumeric data and said graphic data from said first storage means to said display terminal.

4,555,701
LEGIBILITY ENHANCEMENT FOR ALPHANUMERIC DISPLAYS

Richard E. Dahl, Rochester; Daniel P. Faflak, Mazeppa, and Lee A. Sendelbach, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,404
Int. Cl.⁴ G09G *1/08*
U.S. Cl. 340—736 **8 Claims**



1. In a display for alphanumeric character images made up of a matrix of individual dots having a character-generator means for producing a raw video signal having first and second levels, and having attribute means for producing an attribute signal specifying a normal mode in which said first level represents said image dots and specifying a reverse mode in which said second level represents said image dots, said images being substantially the same overall size in both said modes, the improvement comprising:

timing means responsive to said raw video signal for producing a modified video signal having first and second dot durations different from each other; and

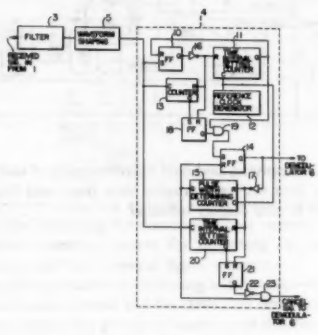
switching means responsive to said attribute signal for selectively enabling said timing means to produce dots of said first and second durations for said normal mode and for said reverse mode respectively.

4,555,702

REMOTE CONTROL SIGNAL REPRODUCING CIRCUIT

Shigeo Matsuura, Chigasaki; Uji Ito, and Yasuhiro Yakushiji, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,254
Claims priority, application Japan, Sep. 17, 1981, 56-145624
Int. Cl.[4] H04Q *1/36;* H03K *5/20*
U.S. Cl. 340—825.64 4 Claims



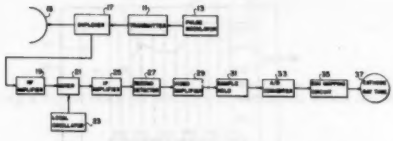
1. A signal reproducing circuit comprising:
an input terminal for receiving a modulated transmission signal subjected to a pulse modulation;
at least one of first, second and third noise rejection means for eliminating noise from the modulated transmission signal received by said input terminal; and
an output terminal to which a reproduced output signal reproduced from the modulated transmission signal removed of noise by said noise rejection means is delivered,
said first noise rejection means including;
first time setting means connected between said input terminal and said output terminal, for setting a first predetermined time interval starting from a time at which an initial pulse of said modulated transmission signal is received by said input terminal, and
first pulse counting means coupled to said first time setting means, for counting the number of the pulses received by said input terminal during said first predetermined time interval and allowing the reproduced output signal to be delivered to said output terminal when the number of the counted pulses exceeds a first predetermined number,
said second noise rejection means including;
second time setting means connected between said input terminal and said output terminal, for setting a second predetermined time interval following lapse of said first predetermined time interval, and
second pulse counting means coupled to said second time setting means, for counting the number of the pulses received by said input terminal during said second predetermined time interval and preventing delivery of the reproduced output signal to said output terminal when the number of the counted pulses is below a second predetermined number,
said third noise rejection means including;
third time setting means connected between said input terminal and said output terminal, for setting a third predetermined time interval following lapse of said second predetermined time interval and
third pulse counting means coupled to said third time setting means, for counting the number of the pulses received by said input terminal during said third predetermined time interval and preventing delivery of the reproduced output signal to said output terminal when the number of the counted pulses exceeds a third predetermined number.

4,555,703

ENVIRONMENTAL MAPPING SYSTEM

Ben H. Cantrell, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 19, 1980, Ser. No. 160,877
Int. Cl.[4] G01S *7/44*
U.S. Cl. 343—5 SA 17 Claims



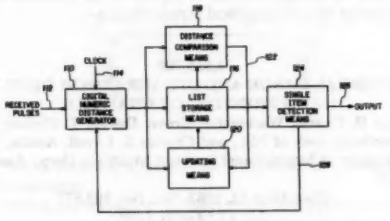
1. An environmental mapping system comprising:
input means for receiving a first signal representing the amplitude of a first pulse-echo return versus time after transmission, for subsequently receiving a second signal representing the amplitude of a second pulse-echo return versus time after transmission and for simultaneously outputting the second signal and a delayed replica of the first signal;
echo source classification means, connected to the input means to receive the second signal and the delayed replica of the first signal, for generating a plurality of classification signals, each classification signal representing the expectation of finding an echo from a respective one of a plurality of environmental sources in the amplitudes of the first and second pulse-echo returns versus time after transmission; and
output means for connecting the echo source classification means to a display means to transmit to the display means any of the plurality of classification signals.

4,555,704

RANGE REPLY SEARCH APPARATUS

Jan E. Treise, West Melbourne, Fla., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 15, 1982, Ser. No. 441,454
Int. Cl.[4] G01S *13/00*
U.S. Cl. 343—7.3 6 Claims



1. The method of searching for range indicating pulse signals received as part of distance measuring equipment (DME) comprising, the steps of:
forming a list of computed numeric distance indications, over a first predetermined period of time, corresponding to times of receipt of a first set of pulse signals from a signal source;
logically combining computed numeric distance indications, obtained over a second predetermined period of time and corresponding to times of receipt of a second set of pulse signals from said signal source, with those distance indications in said list to produce difference result values;
updating said list of computed numeric distance indications to include only those computed numeric distance indica-

tions, obtained from said second set of pulse signals, that are instrumental in producing logical result values that are less than a predetermined absolute value; and

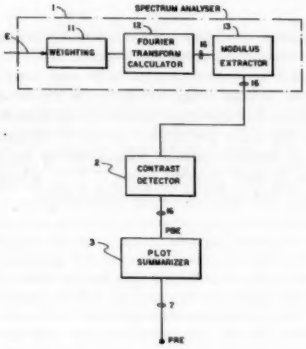
repeating said combining and updating until there is only one distance indication left in said list.

4,555,705

SYSTEM FOR PROVIDING A SUMMARIZED INFORMATION ON THE LINE SPECTRUM FROM A DOPPLER RADAR SPECTRUM ANALYZER

Jean-Louis G. Bossennec, Elancourt; Jean-Claude A. Debuisser, Trappes, and Philippe F. Farhi, Paris, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 19, 1982, Ser. No. 442,935
Int. Cl.[4] G01S *13/50*
U.S. Cl. 343—55 A **3 Claims**



1. A Doppler radar plot summarizer for moving targets supplying a digital signal for one or more targets, said signal for each target range called an elementary summary plot, PRE, corresponding to a given delay of the received signal, said digital signal consisting of one target detection bit D, one bit V indicating whether the target is a single-speed target and one word of m+1 bits containing information on the speed of that target, if the target is of a single speed, wherein said plot summarizer receives a digital signal called an elementary raw plot, PBE, from a circuit comprising in series a 2^m point spectrum analyser, made up of a weighting circuit, a 2^m Fourier transform calculator and a modulus extractor, and a contrast detector furnishing, for each of these target ranges, said elementary raw plot consisting of one word of 2^m bits, the weighting performed by said weighting circuit being such that it limits the maximum number of cyclically contiguous lines for which a single-speed target is detected to $2^m/4+1$, said plot summarizer comprising:

four read-only memories respectively addressed by a first, a second, a third and a fourth group of bits of said elementary raw plot and providing at their outputs corresponding digital signals of m+3 bits called pseudosummaries, said first group consisting of bits 0 to $2^{m-1}-1$ of the elementary raw plot, said second group consisting of bits 2^{m-2} to $2^{m-1}+2^{m-2}-1$ of the elementary raw plot, said third group, complementary to said first group, consisting of bits 2^{m-1} to 2^m-1 of the elementary raw plot and said fourth group, complementary to said second group, consisting of bits $2^{m-1}+2^{m-2}$ to 2^m-1 and 0 to $2^{m-2}-1$ of the elementary raw plot; and

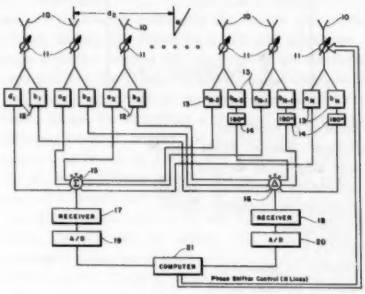
a logic circuit for reconstituting said elementary summary plot from said pseudosummaries provided by said four read-only memories.

4,555,706

SIMULTANEOUS NULLING IN THE SUM AND DIFFERENCE PATTERNS OF A MONOPULSE RADAR ANTENNA

Randy L. Haupt, 179 Hudson Rd., Stow, Mass. 01775

Filed May 26, 1983, Ser. No. 498,334
Int. Cl.[4] G01S *3/44, 3/38, 13/44*
U.S. Cl. 343—379 **2 Claims**



1. In a monopulse radar system having: a phased array antenna, said phased array antenna comprising a multiplicity of equally spaced antenna elements, a sum channel means and a difference channel means connected to receive radar signals from said antenna and transmit sum and difference signals to radar receiver means, and computer means, said computer means generating interference source direction data θ_m from received radar signals; the improvement residing in nulling means for effecting, simultaneous nulling in antenna sum and difference patterns, said nulling means comprising

an adaptive weight, w_n, associated with each antenna element, each said adaptive weight being represented by $w_n=1+\alpha_n+j\beta_n$, and

means for setting each said adaptive weight, w_n, in response to data developed by said computer, said computer developing weight settings in accordance with the functions

$$\alpha_n = Re[A^+(AA^+)^{-1}B]$$

$$\beta_n = Im[A^+(AA^+)^{-1}B]$$

wherein

$$A = \begin{bmatrix} a_1 e^{jd_1(u_1-u_s)} & \cdots & a_N e^{jd_N(u_1-u_s)} \\ \vdots & & \vdots \\ a_1 e^{jd_1(u_M-u_s)} & \cdots & a_N e^{jd_N(u_M-u_s)} \\ b_1 e^{jd_1(u_1-u_s)} & \cdots & b_N e^{jd_N(u_1-u_s)} \\ \vdots & & \vdots \\ b_1 e^{jd_1(u_M-u_s)} & \cdots & b_N e^{jd_N(u_M-u_s)} \end{bmatrix}$$

-continued

$$B = \begin{bmatrix} -\sum_{n=1}^{N} a_n \cos[d_n(u_1 - u_s)] \\ \vdots \\ -\sum_{n=1}^{N} a_n \cos[d_n(u_M - u_s)] \\ -j\sum_{n=1}^{N} b_n \sin[d_n(u_1 - u_s)] \\ \vdots \\ -j\sum_{n=1}^{N} b_n \sin[d_n(u_M - u_s)] \end{bmatrix}$$

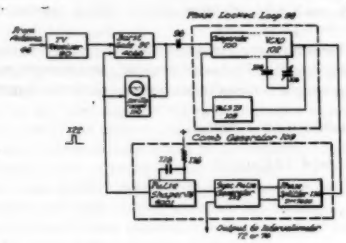
N=number of elements
n=elements number from 1 to N
a_n=sum amplitude weight
b_n=difference amplitude weight
k=propagation constant=$2\pi/\lambda$
λ=wavelength
d_n=n−(N+1)/2
M=number of jammers
m=jammer number from 1 to M
u_m=sin θ_m,
θ_m=direction of m^{th} jammer relative to boresight,
u_s=sin θ_s, and
θ_s=direction of desired signal relative to boresight.

4,555,707

TELEVISION PULSED NAVIGATION SYSTEM

Will A. Connelly, 5220 SW. 8th St., Plantation, Fla. 33317

Continuation of Ser. No. 412,219, Aug. 27, 1982, abandoned. This application May 6, 1985, Ser. No. 731,331
Int. Cl.[4] G01S *1/24, 3/02*
U.S. Cl. 343—387 **15 Claims**



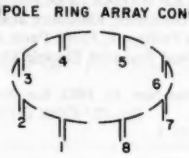
1. A method in aid of navigation and positioning using television and no other radiated signals comprising the steps of:
receiving simultaneously at an unknown location two television signals each containing a mutually common and idehtical redundant waveform component, said component being identically positioned in each said signal in accordance with the technical standard pertaining to said signals, said signals being radiated synchronously from two different known locations;
extracting said component from each of said signals;
measuring and delivering as output the measurement of the elapsed time between extraction of said component from first one received said signal and then from the other received said signal; and
deriving from said output and known locations a hyperbolic line of position to define a first coordinate of the unknown location.

4,555,708

DIPOLE RING ARRAY ANTENNA FOR CIRCULARLY POLARIZED PATTERN

Douglas K. Waineo, Placentia, and Sam S. Wong, Yorba Linda, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 10, 1984, Ser. No. 569,642
Int. Cl.[4] H01Q *21/20, 1/28*
U.S. Cl. 343—799 **4 Claims**



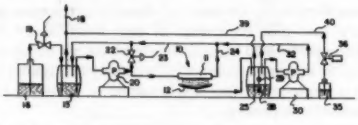
1. In an antenna configuration for a satellite having a first array beamed toward the earth, and a second array with a null toward the earth for communication with other satellites;
wherein said second array comprises N dipole elements arranged in a ring forming a full circle, the diameter of the ring and the phase distribution to the N elements being selected to produce circular polarization in the far field, the phase to each element being P° I/N, where P is a multiple of 360° and I is the element number.

4,555,709

INK RECONSTITUTION SYSTEM AND METHOD FOR INK DROP PRINTER

Arnold J. Greeson, Midlothian, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 12, 1984, Ser. No. 599,375
Int. Cl.[4] G01D *9/00, 15/16*
U.S. Cl. 346—1.1 **7 Claims**

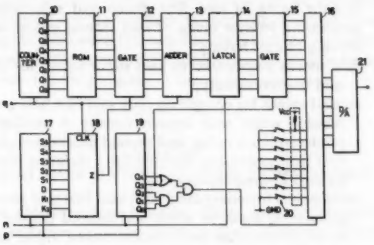


5. A method of maintaining the consistency of printing ink in the ink supply system of an ink drop printer, in which evaporation of solvents occurs to the ink component which is not printed but is caught in a catcher tray or the like and returned to the ink system, comprising the steps of:
collecting all of the non-printed ink in a catcher and delivering the same to a temporary holding vessel,
defining fixed predetermined volumes of such collected ink for return to the system,
mixing with each of said fixed volumes a predetermined amount of ink replenisher to make up for solvent loss in such quantities, which amount is exclusively related to said volumes, and
returning said mixture to the ink supply system.

4,555,710
CHARGE-CONTROLLED INK-JET PRINTING METHOD AND APPARATUS

Takahisa Koike, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 20, 1982, Ser. No. 451,193
Claims priority, application Japan, Dec. 20, 1981, 56-205728
Int. Cl.[4] G01D *9/00, 15/18*
U.S. Cl. 346—1.1 4 Claims

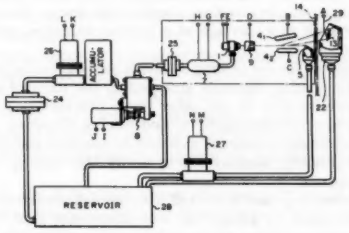


1. A method for controlling the charging on ink droplets in a charging type ink-jet printer which forms a printed image on a recording medium by passing a first series of varyingly charged ink droplets through an electric field, deflecting ink droplets to be used for printing by causing those printing ink droplets having a first charging state at a print level to reach the recording medium, and collecting with a gutter ink droplets not to be used for printing by preventing those nonprinting ink droplets having a second charging state at a non-print level from reaching the recording medium, said method characterized by a step of charging a last ink droplet of said nonprinting ink droplets having said second charging state at a non-print level to a third charging state at a transitional level, which is different from said non-print level but still sufficient to cause collection by said gutter and is of the same polarity as a next following series of ink droplets having said first charging state at the print level for printing, thereby allowing to prevent a first printing ink droplet of said following series from catching up with said last ink droplet of said non-printing droplets of said first series.

4,555,711
DEFLECTION CONTROL INK JET OPERATION ADJUSTMENT CONTROL

Tsutomu Sato, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,389
Claims priority, application Japan, Aug. 30, 1982, 57-150390; Aug. 30, 1982, 57-150392
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—75 2 Claims



2. A deflection control type ink jet recording apparatus having an ink ejection head equipped with an ink ejection nozzle and a vibrator for applying pressure vibration having a predetermined period to ink which is communicated to the ink ejection nozzle, a pump for supplying ink under pressure to the ink ejection head, a charging electrode for applying a charging electric field to ink ejected from the nozzle, and a deflection electrode for applying a deflecting electric field to a charged ink drop, said ink jet recording apparatus comprising:

charge voltage generator means for generating a record charge pulse equivalent in period to the pressure vibration and having a comparatively large width, and a search charge pulse common in period to and smaller in width than the record charge pulse, said charge voltage generator means selectively supplying and charg electrode with the record charge pulse and the search charge pulse;

electrode means for detecting a charged ink drop;

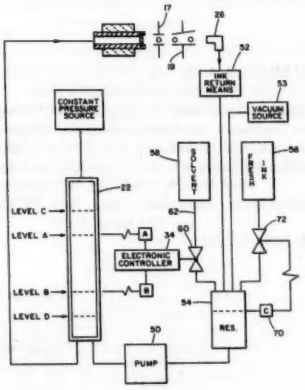
charge detector means for generating an electrical signal representing the presence/absence of a charged ink drop, said charge detector means being connected to said electrode means for detecting a charged ink drop; and

electronic control means for performing an ink ejection control inclusive of a start and a stop of operation of the pump, and a phase search control which predetermines one of a separation phase of ink drops and a phase of charging pulses relative to the other, said control means being constructed to, when failed to predetermine an adequate phase by at least one cycle of phase shifts in the phase search control, temporarily stop ink ejection and, after a predetermined period of time, resume ink ejection for a second phase search control.

4,555,712
INK DROP VELOCITY CONTROL SYSTEM

George Arway, Norridge; Frank Eremity, Hanover Park; George Dick, Chicago, all of Ill., and Elaine Pullen, Brentwood, England, assignors to Videojet Systems International, Inc., Elk Grove Village, Ill.

Filed Aug. 3, 1984, Ser. No. 637,404
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 16 Claims



16. A method for controlling ink drop velocity in a drop marking system having an ink supply, a nozzle to form a stream of ink drops and a pressure source to force the ink to the nozzle from the supply, said method comprising the steps of:

(a) measuring the time interval required for a known volume of ink to flow to said nozzle,

(b) comparing the time interval against a reference value to identify deviations therefrom,

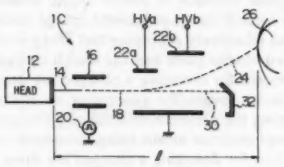
(c) altering the ink flow rate to maintain said time interval substantially equal to said reference value.

4,555,713

POWER SOURCE DEVICE FOR INK JET PRINTER

Kazumi Ishima, Kashiwa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,472
Claims priority, application Japan, Apr. 20, 1983, 58-69540
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 5 Claims



1.

A power source device for a charge and deflection type ink jet printer which has at least a first deflection electrode and a second deflection electrode separate from the first deflection electrode, comprising:

a DC power source;

a voltage control circuit for controlling an output voltage of said DC power source;

a transformer for varying a magnitude of a controlled voltage supplied from said voltage control circuit to a primary winding and producing the varied controlled voltage from a secondary winding;

a first shaper and a second shaper for individually rectifying and smoothing a voltage appearing at said secondary winding of said transformer and applying outputs of said first shaper and said second shaper to the first deflection electrode and the second deflection electrode as a first deflection voltage and a second deflection voltage respectively; and

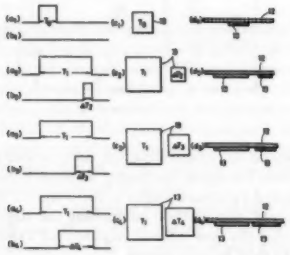
a discharging time constant control circuit for substantially equalizing discharging time constants of output voltages of the first shaper and the second shaper.

4,555,714

APPARATUS AND METHOD FOR THERMAL INK TRANSFER PRINTING

Itsuo Takanashi; Hideshi Tanaka; Terumi Ohara, all of Yokohama; Toshinori Takahashi, Kawasaki; Shigeru Kato, Tokyo; Tsutomu Kiuchi, Yokohama, and Hiroki Kitamura, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Nov. 9, 1984, Ser. No. 669,783
Claims priority, application Japan, Nov. 12, 1983, 58-211716
Int. Cl.[4] B41J *3/20*
U.S. Cl. 346—76 PH 2 Claims



1. Apparatus for thermal ink transfer printing, comprising:

(a) a thermal head having a plurality of heat generating resistors arranged in line for melting thermally fusable ink attached to an ink sheet, first and second groups of heat generating resistors respectively corresponding to two alternate arrangements of said heat generating resistors being arranged so that each of said second group is positioned within a pre-heating region of said first group;

(b) a head driving circuit responsive to an input signal for energizing said heat generating resistors such that each datum representing a desired density of a pixel is used to energize first and/or second heat generating resistors positioned close to each other, said first heat generating resistor being of said first group and said second heat generating resistor being of said second group, said head driving circuit having;

first means responsive to said input signal for detecting said desired density;

second means for energizing only said first heat generating resistor when said desired density is smaller than a predetermined value, said second means energizing said first heat generating resistor for a duration determined by said desired density; and

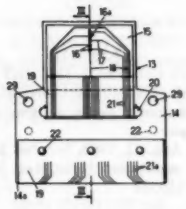
third means for energizing both said first and second heat generating resistors when said desired density is equal to or greater than said predetermined value, said third means energizing said first heat generating resistor for a predetermined maxium duration and said second heat generating resistor, for a duration determined by said desired density, in such a manner that an end of the energizing duration of said second heat generating resistor corresponds to an end of the energizing duration of said first heat generating resistor.

4,555,715

THERMAL PRINTHEAD MOUNTING CONTROL

Patrick Vegeais, St Germain en Laye; Michel Brot, Argenteuil, and Jean-Yves Valet, Beauchamp, all of France, assignors to Societe d'Applications Generales d'Electricite et de Mecaniques Sagem

Filed Jul. 5, 1984, Ser. No. 627,985
Claims priority, application France, Jul. 8, 1983, 83 11448
Int. Cl.[4] G01D *15/10*; B41J *3/20*
U.S. Cl. 346—76 PH 12 Claims



1. Writing device with heating elements for printing by thermal action on a writing support, this device being fixed to a base such as a carriage of a printing machine, said device comprising:

a support for the heating elements bearing, on the one hand, the heating elements arranged in the form of electrical resistors and, on the other hand, first electrical contacts connected electrically to said heating elements,

an intermediate support mounted on said base and adapted to removably support mechanically the heating elements support,

a connecting part provided with second electrical contacts arranged to cooperate with abovesaid first electrical contacts of the heating elements support and attached respectively to the base,

fastening means to fix the intermediate support and the connecting part to the base ,

means for positioning the heating elements support on the

intermediate support arranged so that the heating elements occupy, in operating position, a position pre-determined with respect to the writing support and the first and second electrical contacts respectively of the heating elements support and the connecting part cooperate mutually,

and locking means to make fast mechanically and removably the heating elements support to the intermediate support,

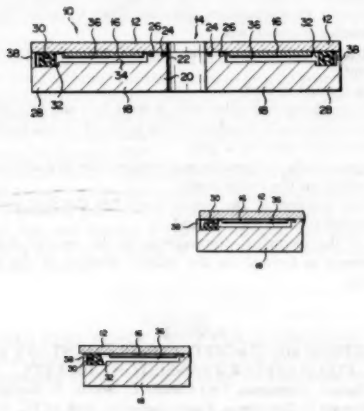
wherein the fastening means comprise a fixed rotary axle borne by the base and to which are hinged the intermediate support and the connecting part, control means being interposed between the base and the intermediate support to position the intermediate support angularly in a manner suitable for the progress of the writing process.

4,555,716

OPTICAL DISK HAVING ELASTIC DEFORMABLE SPACER

Kazuharu Odawara, and Yoshiaki Tago, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 12, 1983, Ser. No. 541,307
Claims priority, application Japan, Oct. 14, 1982, 57-180277
Int. Cl.⁴ G01D *15/34*
U.S. Cl. 346—137 **19 Claims**



1. An optical disk comprising:

a recording layer for storing data which is adapted to be read upon irradiation with a laser beam;

a protective plate for protecting said recording layer, with said recording layer being formed on one major surface of said plate, said plate being adapted to allow transmission of a laser beam therethrough;

a substrate, opposing said protective plate, for supporting said protective plate so as to form a space therebetween and having an outer wall around an outer peripheral portion of said substrate extending to support an outer peripheral portion of said plate, said recording layer being formed between said protective plate and said substrate; and

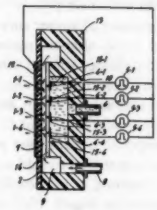
an elastically deformable spacer, disposed within said space radially inward of said wall close thereto and attached to said protective plate and said substrate, for coupling said protective plate and said substrate through said space so as to allow expansion and contraction of said protective plate and said substrate relative to each other without deformation of said plate.

4,555,717

INK JET PRINTING HEAD UTILIZING PRESSURE AND POTENTIAL GRADIENTS

Masayoshi Miura, Kawasaki, and Hiroshi Naito, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jun. 16, 1983, Ser. No. 505,353
Claims priority, application Japan, Jun. 16, 1982, 57-104202
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **14 Claims**



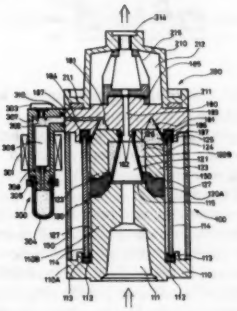
1. An ink jet printing head comprising an air flow chamber having a front channel, an air intake channel connected to a source of pressurized air for directing an airstream to said front channel so that the airstream makes a sharp turn at the entry into said front channel creating a sharp pressure gradient, a liquid chamber connected to a source of ink, an insulative plate defining on one side thereof part of said liquid chamber and defining on the other side thereof part of said air intake channel, the insulative plate having a rear channel axially aligned with said front channel, a first electrode disposed around said front channel, and a second electrode disposed on a rear side wall of said insulative plate and encircling said rear channel for establishing an electric field between said first and second electrodes by which liquid is discharged from the liquid chamber through the aligned rear and front channels in response to a potential developed across said first and second electrodes.

4,555,718

PIEZO ACTIVATED PUMP IN AN INK LIQUID SUPPLY SYSTEM

Masahiko Aiba, Nara; Masaaki Kuranishi, Yamatokoriyama, and Hideyuki Miyake, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 19, 1984, Ser. No. 572,054
Claims priority, application Japan, Jan. 25, 1983, 58-11042
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—140 R **4 Claims**



1. An ink liquid supply system for an ink jet system printer comprising:

an ink liquid reservoir containing water-color ink;

a liquid supply pump system connected to introduce said water-color ink from said ink liquid reservoir, and developing a pressurized ink liquid;

first conduit means, disposed between said ink liquid reservoir and said liquid supply pump system, for supplying said water-color ink to said liquid supply pump system; and

second conduit means for supplying said pressurized ink liquid developed from said liquid supply pump system to a nozzle unit,

said liquid supply pump system comprising:

a cylinder shaped vibration pipe;

a cone shaped pressure chamber surrounded by a resilient member, said cone shaped pressure chamber being diposed in said cylinder shaped vibration pipe in a manner that a cavity is formed between said cylinder shape vibration pipe and said resilient member;

an inlet passage connected to said first conduit means;

an inlet valve disposed at said inlet passage;

an outlet passage connected to said second conduit means;

an outlet valve disposed at said outlet passage; and

a vibration transferring liquid filled in said cavity formed between said cylinder shaped vibration pipe and said resilient member.

4,555,719

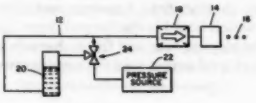
INK VALVE FOR MARKING SYSTEMS

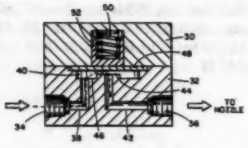
George Arway, Norridge; Frank Eremity, Hanover Park, and Tung M. Huang, Elk Grove Village, all of Ill., assignors to Videojet Systems International, Inc., Elk Grove Village, Ill.

Filed Aug. 19, 1983, Ser. No. 524,658

Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—140 R **7 Claims**





1. A system for controllably supplying ink to a remotely located drop marking nozzle comprising:

(a) an ink reservoir having a supply of ink therein,

(b) a drop marking nozzle remotely located from the ink reservoir and in communication therewith by means of a flexible fluid conduit,

(c) means for pressurizing said reservoir to deliver ink from the reservoir to the nozzle via said conduit and for depressurizing said reservoir to terminate ink flow and release the energy stored in the walls of the flexible fluid conduit,

(d) valve means adjacent said nozzle responsive solely to pressure variations in the fluid conduit, for preventing ink flow and nozzle drool when the fluid pressure in said conduit is below a selected value and for permitting ink flow to the nozzle when the fluid pressure is above said selected value.

4,555,720

INFRA-RED RADIATION DETECTORS AND THEIR MANUFACTURE

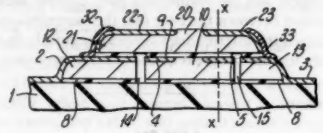
John B. Readhead, Lyndhurst, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1983, Ser. No. 463,210

Claims priority, application United Kingdom, Mar. 3, 1982, 8206290

Int. Cl.⁴ H01L *27/14, 27/12*

U.S. Cl. 357—30 **12 Claims**



1. An infrared radiation detector comprising:

a substrate;

a lower body of infrared-sensitive material mounted on the substrate, said lower body having at least one first detector element formed therein;

an upper body of infrared-sensitive material mounted on the lower body, said upper body having at least one second detector element formed therein directly above the first detector element, said second detector element having detector characteristics different from those of the first detector element; and

electrical connections to the first and second detector elements;

characterized in that:

the lower body is divided into at least first and second portions electrically insulated from each other and separated from each other by a gap;

the upper body bridges the gap between the first and second portions of the lower body;

the first portion of the lower body has the first detector element formed therein; and

one of the electrical connections to the second detector element is formed on the second portion of the lower body.

4,555,721

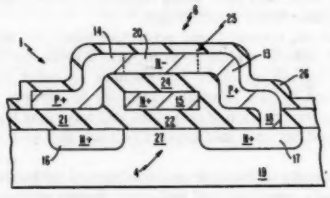
STRUCTURE OF STACKED, COMPLEMENTARY MOS FIELD EFFECT TRANSISTOR CIRCUITS

Jai P. Bansal, Manassas, Va.; Claude L. Bertin, S. Burlington, and Ronald R. Troutman, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 265,001, May 19, 1981. This application Nov. 4, 1983, Ser. No. 548,733

Int. Cl.⁴ H01L *29/04, 27/02*

U.S. Cl. 357—42 **3 Claims**



1. A stacked CMOS, two-input NAND integrated circuit comprising:

a first diffusion bar of N-type conductivity in a P-type silicon substrate;

a second diffusion bar of N-type conductivity in said substrate located in spaced, parallel relationship with said first bar forming a first N channel region therebetween;

a third diffusion bar of N-type conductivity in said substrate located in spaced, parallel relationship with said second bar forming a second N channel region therebetween;

a first logical input gate electrode juxtaposed over said first N channel region which is covered by an insulating layer, with said first N channel region forming a first N channel FET device;

a first layer of phosphosilicate glass on top of said first gate electrode;

a second logical input gate electrode juxtaposed over said second N channel region which is covered by an insulating layer, with said second N channel region forming a second N channel FET device;

a second layer of phosphosilicate glass on top of said second gate electrode;

a layer of laser annealed silicon having a first N-type portion covering said juxtaposed portion of said first gate electrode and formed by the diffusion of phosphorous atoms out from said first layer of phosphosilicate glass, a first P-type portion juxtaposed over said first bar and a second P-type portion juxtaposed over said second bar, forming a first P channel FET device;

said silicon layer having a second N-type portion covering said juxtaposed portion of said second gate electrode and formed by the diffusion of phosphorous atoms out from said second layer of phosphosilicate glass, and a third P-type portion juxtaposed over said third bar forming a second P channel FET device with said second P-type portion;

said first diffusion bar connected to a logical output terminal, said third diffusion bar connected to ground potential, said second diffusion bar operating as the source of said first N channel FET and the drain of said second N channel FET and said third diffusion bar operating as the source of said second N channel FET;

said first and third P-type portions of said layer connected to said logical output, said second P-type portion connected to a positive potential to operate as the source for both said first and second P channel devices, and said third P-type portion operating as the drain for said second P channel device.

4,555,722

TRI-LEVEL SANDCASTLE PULSE DECODER

Leopold A. Harwood, Bridgewater, N.J., and Robert L. Shanley, II, Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 14, 1983, Ser. No. 561,331
Int. Cl.⁴ H04N 9/535
U.S. Cl. 358—17 **10 Claims**

1. A sandcastle pulse decoder for use with a sandcastle pulse source delivering a train of trilevel pulses, inclusive of first pulse components exhibiting a first voltage level, second pulse components exhibiting a second voltage level lower than said first voltage level, and third pulse components exhibiting a third voltage level intermediate said first and second voltage levels, to a pulse input terminal; said decoder comprising:

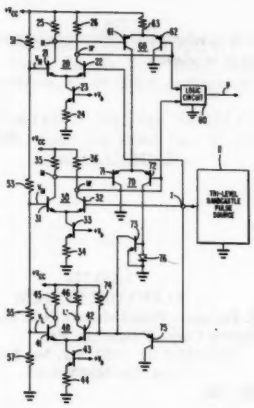
a source of DC potential;

a voltage divider, connected across said DC potential source and having a plurality of divider output terminals at which respectively different reference voltages appear;

a first voltage comparator, having a reference input and a signal input, said reference input being connected to one of said divider output terminals to receive one of said reference voltages; said first voltage comparator exhibiting a first state of operation when the voltage at its signal input is below a first threshold potential related to said one reference voltage and exhibiting a second state of operation when the voltage at its signal input significantly exceeds said first threshold potential, one of said voltage levels of said trilevel pulse train components lying below said first threshold potential whereas the next higher of said voltage levels of said trilevel pulse train components significantly exceeds said first threshold potential;

first coupling means for coupling said pulse input terminal to said signal input of said first voltage comparator;

a second voltage comparator, having a reference input and a signal input, said reference input being connected to another of said divider output terminals to receive a second one of said reference voltages; said second voltage comparator exhibiting a first state of operation when the voltage at its signal input is below a second threshold potential related to said second reference voltage, and exhibiting a



second state of operation when the voltage at its signal input significantly exceeds said second threshold potential; both said one and said next higher of said voltage levels of said trilevel pulse train components significantly exceeding said second threshold potential;

second coupling means for coupling said pulse input terminal to said signal input of said second voltage comparator; and

control means, responsive to the operating state of said first voltage comparator, for holding the voltage at said signal input of said second voltage comparator below said second threshold potential when said train of trilevel pulses exhibits said next higher of said voltage levels.

4,555,723

APPARATUS FOR REDUCING MOTION INDUCED DISTORTION IN A FRAME COMBED CHROMINANCE SIGNAL

Dalton H. Pritchard, Princeton Township, Mercer County, N.J., assignor to RCA Corporation, Princeton Township, Mercer County, N.J.

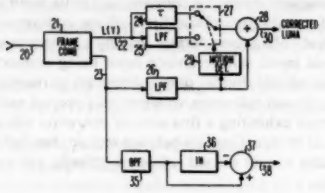
Filed Feb. 6, 1984, Ser. No. 576,241
Int. Cl.⁴ H04N 9/535, 5/21
U.S. Cl. 358—31 **6 Claims**

6. Apparatus for separating the chrominance signal component from composite video signal comprising:

a source of composite video signal;

a frame comb filter having an input terminal coupled to said source and an output terminal at which frame comb filtered chrominance signal is available;

an interline comb filter having an input terminal coupled to the output port of said frame comb filter and an output



terminal at which said separated chrominance signal component is available.

4,555,724

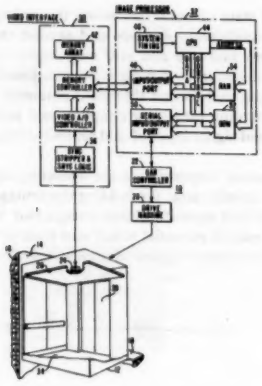
ELEVATOR SYSTEM

Emanuel E. Enriquez, West Caldwell, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1983, Ser. No. 544,196

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—93 **6 Claims**



1. A method of determining elevator car loading, comprising the steps of:

providing a video image of the car, with said video image having a predetermined number of picture elements (pixels),

determining the gray level of each pixel,

comparing the gray level of each pixel with a predetermined reference value to determine loaded pixels,

discarding loaded pixels which do not have a predetermined relationship with adjacent pixels,

totalling the number of loaded pixels, after the discarding step,

and comparing the number of loaded pixels with the predetermined number of pixels to obtain an indication of car loading.

4,555,725

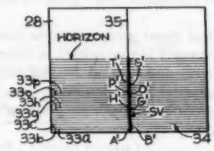
AGRICULTURAL IMPLEMENT STEERING GUIDANCE SYSTEM AND METHOD

Allois F. Geiersbach, Milwaukee, Wis., and David L. Murray, La Porte, Ind., assignors to Deutz-Allis Corporation, Milwaukee, Wis.

Filed Aug. 24, 1983, Ser. No. 526,080

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—93 **8 Claims**



1. A method of visually displaying an elongated indicating marking on the surface of a field to an operator at an operator's station on a mobile farm implement to indicate the path to be steered in order for the implement to traverse the desired swath, comprising the steps of imaging a substantial length of said sensed indicating marking forwardly of said operator's station and implement on a video camera at a slight angle to the horizontal from a position adjacent an outer extremity of said implement whereby the image includes the horizon and displaying the image of said substantial length of said indicating marking viewed by said camera along a substantial height of the raster of a video monitor in the field of view of the operator, whereby each scanning line of the video monitor raster below the horizon creates a spot representing a different point on said substantial length of said sensed indicating marking and the multiplicity of points created by said raster scanning lines forms a steering vector extending to the horizon indicating the direction the implement should be steered in order to traverse the desired swath and maintain constant spacing between successive swaths.

4,555,726

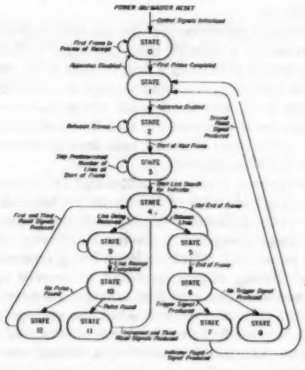
VIDEO TARGET TRACK VALID INDICATOR

Brent A. Teeter, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 5, 1984, Ser. No. 586,366

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—93 **7 Claims**



1. Apparatus for monitoring a video signal in a line by line,

frame by frame sequence for the existence of an indicator signal where said video signal includes vertical sync signals indicative of the start of each video frame and horizontal sync signals indicative of the start of each video line in a video frame and where said indicator signal is a plurality of qualified white pulses imposed one pulse per video line in a predetermined number of consecutive video lines in a video frame, said qualified white pulses being pulses both exceeding a predetermined brightness level and having a duration falling within a predetermined range of durations, said monitoring apparatus comprising:

video signal stripper means having said video signal as an input, for extracting said vertical sync signals, said horizontal sync signals and white pulses from said video signal, said extracted white pulses being white pulses in said video signal having a brightness level exceeding said predetermined brightness level established for said qualified white pulses;

pulse length checking means receiving said extracted white pulses as an input, for determining the duration of each extracted white pulse received and producing a pulse found signal in response to receipt of an extracted white pulse having a duration falling within said predetermined range of durations established for said qualified white pulses;

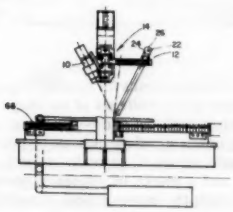
indicator finding means incremented in response to production of a pulse found signal by said pulse length checking means, for producing a trigger signal, said indicator finding means producing said trigger signal in response to being incremented a predetermined number of times prior to being cleared, said predetermined number of times said finding means is required to be incremented to produce said trigger signal being equal to said predetermined number of consecutive video lines in which said qualified white pulses must exist to constitute a valid indicator signal; and

a system controller electrically connected to said stripper means, said pulse length checking means and said indicator finding means, said controller producing a plurality of system control signals, said control signals including an indicator found signal, said indicator found signal produced by said controller in response to production of a trigger signal by said indicator finding means indicating receipt by said monitoring apparatus of a video frame containing a valid indicator signal.

4,555,727
OPTICAL SCANNING APPARATUS

Emmanuel B. Nun, Jerusalem; Rafi Izhar, Mazkeret Batya, and Avner Karpol, Nes Ziona, all of Israel, assignors to Optrotech Ltd., Nes Ziona, Israel

Filed Sep. 14, 1983, Ser. No. 532,172
Claims priority, application Israel, Sep. 14, 1982, 66788
Int. Cl.⁴ H04N 7/18
U.S. Cl. 358—106 **5 Claims**



1. Scanning apparatus, comprising:

a base;

a light source mounted on said base;

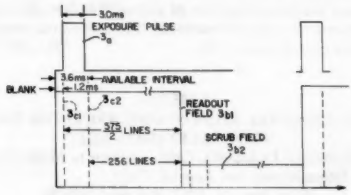
a camera mounted on the base and arranged to observe a workpiece surface to be scanned; and

an optical waveguide arranged in light receiving relationship with said light source for directing light from a light output surface thereof to said workpiece surface, said optical waveguide being operative to provide uniform, homogeneous, diffuse illumination of the workpiece surface, thereby to prevent definition of shadows thereon, said optical waveguide comprising a slab of optically transmissive material formed with a ground surface at the light output surface thereof for diffusing the light output therefrom, said ground surface being disposed adjacent the workpiece.

4,555,728
DIGITAL FLUOROGRAPHY

Paul Fenster, Petah Tikvah; Zvi Netter, Haifa, and Yair Shimoni, Jerusalem, all of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Oct. 27, 1983, Ser. No. 546,177
Claims priority, application Israel, Nov. 26, 1982, 67344
Int. Cl.⁴ H04N 5/32
U.S. Cl. 358—111 **34 Claims**



22. A method of examining an object by repeatedly exposing the same to a source of penetrating radiation, said method comprising the steps of:

(a) converting the radiation transmitted to the object to a pattern of electrical charges on the mosaic of a TV camera;

(b) scanning repeatedly said mosaic with an electron beam controlled by scanning signals to read out during scanning intervals electrical signals representing frames of the object examined;

(c) separating said scanning signals with blanking signals operating for intervals shorter than said scanning intervals for blanking the TV camera between readout frames; and

(d) energizing said source of penetrating radiation with exposure pulses applied during intervals at least partially concurrent with said blanking signals.

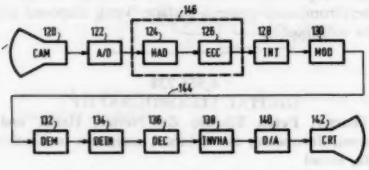
4,555,729
SYSTEM FOR TRANSMITTING TELEVISION PICTURE INFORMATION USING AN ERROR-PROTECTION CODE

Leonardus M. H. E. Driessen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,685
Claims priority, application Netherlands, Dec. 23, 1981, 8105799
Int. Cl.⁴ H04M 7/12
U.S. Cl. 358—133 **6 Claims**

1. In a system for transmitting, over a transmission medium, data for reconstructing a television picture constituted by a plurality of subpicture, said system comprising means for generating subpicture data for reconstructing each of said subpictures, transformation means for receiving subpicture data and transforming said data into a series of a coefficient bits including a most significant bit of respective transformation functions, said transformation functions having associated frequen-

cies including a lowest frequency, said transformation means further comprising encoding means interconnected between said transformation means and said transmission medium for encoding a first subset of k bits of said coefficient bits into a larger group of n bits by a predetermined code having predetermined error detection capabilities for said k bits, said k bits containing at least one bit constituting said most significant bit of said coefficient associated with said transformation function having said lowest frequency;



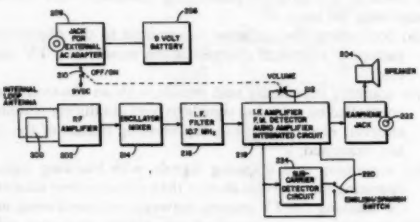
improved encoding means wherein said predetermined code has a first minimum Hamming distance of four for allowing at least single error correction, double-error detection within said k bits, said code further having a second minimum Hamming distance of at least five for allowing double-error correction within an error protected subset of at least two of said k bits.

4,555,730

SINGLE CHANNEL SPLIT-SOUND RECEIVER FOR USE WITH TELEVISION SET

James B. Briggs, La Canada, Calif., assignor to Media Transference International, Los Angeles, Calif.

Filed Jan. 24, 1983, Ser. No. 460,450
Int. Cl.⁴ H04N *5/60*
U.S. Cl. 358—142 **2 Claims**



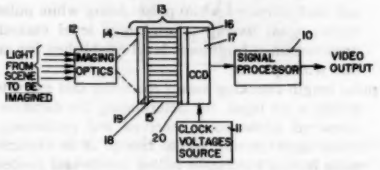
1. A split-sound receiver for reproducing foreign language audio signals accompanying a television signal received on a particular channel of a television receiver, said television receiver radiating a radio frequency signal when the television receiver is tuned to television channel, said television signal including a first sub-carrier modulated in accordance with audio signals representative of a first language and a second sub-carrier modulated in accordance with audio signals representative of a second language, said receiver comprising: an antenna for receiving the radio frequency signal from the television receiver when the television receiver is tuned to a particular television channel; band-pass circuit means coupled to said antenna and tuned to said particular television channel to pass only the radio frequency signal associated with said particular television channel; first detector means coupled to the band-pass circuit means for converting the radio frequency signal passed by said band-pass circuit means into an intermediate frequency signal of a selected intermediate frequency; circuit means coupled to said first detector means and including a sub-carrier detector circuit responsive to said intermediate frequency signal from said first detector means for detecting said second sub-carrier to recover the second language audio signals; a speaker; and output circuit means connecting the output of said sub-carrier detector circuit to said speaker to apply said second language audio signals thereto.

4,555,731

ELECTRONIC IMAGING CAMERA WITH MICROCHANNEL PLATE

Michael Zinchuk, Hyannis, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 30, 1984, Ser. No. 605,188
Int. Cl.⁴ H04N *5/30*
U.S. Cl. 358—209 **17 Claims**



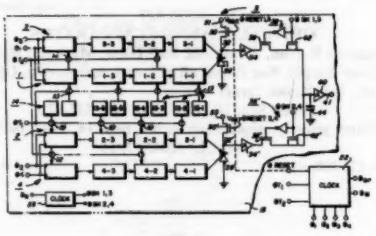
1. Image receiving and converting apparatus for use with an electronic imaging camera, said apparatus comprising means responsive to an image received by the camera of the scene to be reproduced for converting photons into electrons representative of the scene image, electron multiplier means, including an output surface at its output side, coupled to said converting means and responsive to the electrons therefrom representative of the scene image for intensifying the electron representation of the scene image, and a charge transfer device coupled to said output surface and directly responsive to its electron output for producing an electric signal representation of the image received by the camera.

4,555,732

IMAGE SENSOR CORRECTION SYSTEM

Richard H. Tuhro, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 22, 1984, Ser. No. 592,128
Int. Cl.⁴ H04N *5/14*
U.S. Cl. 358—213 **9 Claims**



1. Offset correction means for neutralizing any differences in the shift register offset voltages of an image sensor having at least two discrete banks of parallel in/serial out shift registers for processing image signals generated by plural photosensitive elements of said sensor to provide at least one serial image signal output and a source of reference potential for input to said shift registers; the improvement comprising:

(a) offset signal generating means for generating offset signals representing any offset potential in each of said banks of shift registers;

(b) offset signal comparing means for comparing said offset signals to provide an offset correction potential;

(c) means for summing said offset corrective potential with

said reference potential to provide an adjusted reference potential; and

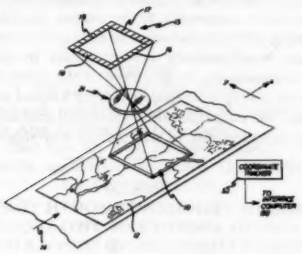
(d) means for inputting said adjusted reference potential to at least one of said shift register banks to neutralize any differences in offset voltages in said shift register banks.

4,555,733

IMAGE ACQUISITION SYSTEM

Enrique Garcia, Sandy Hook, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 25, 1984, Ser. No. 613,932
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—293 **7 Claims**



1. In an image acquisition system wherein a field-of-view is panned over a fixed image format, the combination comprising:

sensor means;

optical means for imaging said field-of-view at said sensor means;

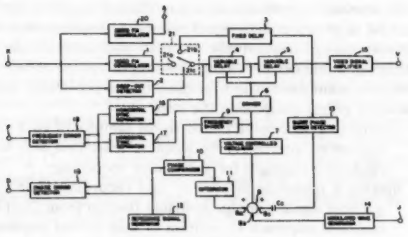
said sensor means including only four linear arrays disposed in quadrilateral configuration.

4,555,734

VIDEO TIME BASE AND DROP OUT CORRECTOR

Tsutomu Fukui, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1982, Ser. No. 409,827
Claims priority, application Japan, Aug. 24, 1981, 56-131628
Int. Cl.[4] H04N *5/94, 5/95*
U.S. Cl. 358—314 **4 Claims**



1. An apparatus for reproducing recorded data, comprising:

a video FM demodulator means for demodulating a video FM signal detected from a video disc and for providing a demodulated video signal;

a variable delay device means connected after said video FM demodulator, and being clock-controlled, for varying the delay time of said demodulated video signal;

a reference signal generator means for generating a reference signal which serves as the reference time base;

a phase-locked loop including at least a voltage controlled oscillator and a phase comparator, in which the oscillating output from said voltage controlled oscillator and said reference signal are supplied to said phase comparator, and said voltage controlled oscillator is controlled by the output produced by said phase comparator so that said oscillating output is synchronized to said reference signal;

a drive circuit means receiving said oscillating output for producing a transfer clock signal which is supplied to said variable delay means to clock-control and to vary the delay time thereof; and

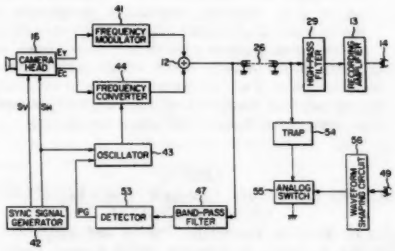
a frequency divider provided between said voltage controlled oscillator and said phase comparator for causing said variable delay means to delay said demodulated video signal for one horizontal sync period according to said reference time base.

4,555,735

INTERCONNECTION SYSTEM BETWEEN IMAGE PICKUP DEVICE AND RECORDING DEVICE

Hiroshi Usuki, and Hiroshi Taniguchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 206,082, Nov. 12, 1980, abandoned.
This application Oct. 4, 1983, Ser. No. 538,834
Claims priority, application Japan, Nov. 19, 1979, 54-160906; Dec. 12, 1979, 54-161773; Apr. 30, 1980, 55-57357
Int. Cl.[4] H04N *9/491*
U.S. Cl. 358—330 **2 Claims**



1. A system for coupling between an image pickup device and a recording device of the type in which rotary head means sequentially records on adjacent tracks at least an angularly modulated luminance signal and a modulated color signal in a frequency range lower than the lowermost sideband of said angularly modulated luminanace signal, said system comprising:

(A) an image pickup device comprising:

(a) first means for converting a received image into a luminance signal and first and second color signals,

(b) second means for effecting angular modulation of said luminance signal derived from said first means,

(c) third means for converting said first and second color signals derived from said first means into a frequency range lower than the lowermost sideband of the angularly modulated luminance signal derived from said second means,

(d) fourth means for controlling the phase of the carriers of said converted first and second color signals in such a way that said converted first and second color signals derived from said third means are interleaved with each other on adjacent tracks upon which said converted first and second color signals are sequentially recorded,

(e) fifth means for deriving an audio signal by means of a microphone attached to said image pickup device, said audio signal being of the base band in a frequency range lower than the frequency range of said converted first and second color signals derived from said third means, and

(f) sixth means for multiplexing at least said angularly modulated luminance signal derived from said second means, said phase-controlled converted first and second color signals derived from said fourth means and said audio signal derived from said fifth means,

(B) a single cable to transmit said multiplexed signal derived from said sixth means to said recording device, and

(C) a recording device comprising:

(a) seventh means for deriving said angularly modulated luminance signal and said phase-controlled converted first and second color signals from said multiplexed signal transmitted through said single signal cable from said image pickup device,

(b) eighth means for recording by means of said rotary head means said angularly modulated luminance signal and said phase-controlled, converted first and second color signals derived from said seventh means in the spectrum as derived,

(c) ninth means for deriving said audio signal from said multiplexed signal transmitted through said single signal cable from said image pickup device,

(d) tenth means for recording said audio signal derived from said ninth means through audio recording circuit means, and

(e) eleventh means responsive to a signal indicative of the rotational position of said rotary head means for controlling said fourth means such that the phase of the color carriers of said converted first and second color signals are shifted by a predetermined amount for each horizontal scanning time interval, said eleventh means including means which controls the passage of harmonics of said angularly modulated luminance signal through said single signal cable in response to the phase of said rotating-phase pulse of said rotary head, and

said fourth means includes means which derives the rotating-phase pulse of said rotary head means by detecting the passage of said harmonics of said angularly modulated luminance signal through said single signal cable.

4,555,736

DISC AND VIDEODISC READER HEAD POSITIONING CONTROL SYSTEM

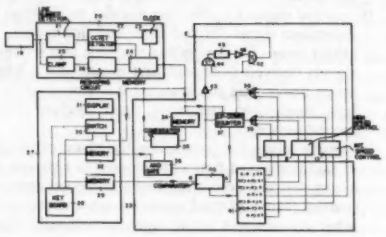
Michel G. Mathieu, Hermitage, France, and Andre J. L. Le Rodallec, 7, Square de Varsovie, 35000 Rennes, France, assignors to Etablissement Public de Diffusion dit Telediffusion de France and Andre J. L. Le Rodallec, both of, France

Continuation-in-part of Ser. No. 42,988, May 29, 1979, abandoned, which is a continuation of Ser. No. 753,994, Dec. 27, 1976, abandoned. This application Apr. 19, 1982, Ser. No. 369,977

Claims priority, application France, Dec. 29, 1975, 75 40403

Int. Cl.[4] H04N *5/76;* **G11B** *21/00*

U.S. Cl. 358—342 **5 Claims**



1. A control system for positioning the reader head of a videodisc reader of the type wherein a picture corresponding to a television frame is recorded on a videodisc track, each recorded television frame including an identifying indication, said control system comprising means for operating said videodisc reader in a picture stop mode, a picture identity detector including a first memory for storing the detected picture identity means for providing a desired picture identity including a second memory for storing the desired picture identity, control means for causing a relative movement between said reader head and said videodisc, and a control circuit for said control means, said control circuit comprising an up-down counter, means connecting the output of said first memory to a preset input of said up-down counter, a comparator having one input connected to the output of said up-down counter and a second input connected to said second memory, whereby said comparator provides an output signal indicative of the difference between the desired picture identity and the contents of said up-down counter, a logic decision circuit having its input connected to the output of said comparator, said logic circuit including means responsive to the output of said comparator for operating said control means so as to reduce said difference to nil and simultaneously deliver pulses to said up-down counter corresponding to an output of the control means, said logic circuit having an output delivering a signal when its input signal is nil, said output of said logic circuit enabling said means operating said videodisc in said picture stop mode.

4,555,737

METHOD OF PROVIDING SMOOTH TRANSITION FROM ONE TO ANOTHER OF TWO SEQUENCES OF DIGITALLY CODED SOUND SIGNALS (FADING)

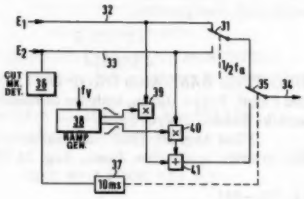
Jürgen Heitmann, Alsbach-Hähnlein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 530,114

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1982, 3233287

Int. Cl.[4] G11B *27/02*

U.S. Cl. 360—13 **4 Claims**



1. Method for disturbance-free slicing together first and second digitally coded signal sequences representing sound corresponding respectively to first and second television scenes in a manner providing freedom of choice of television cut-over point even after trial splicing at a previously selected cut-over point, comprising the steps of:

distributing successive coded signal samples of each of said sequences alternately between at least first and second recording channels for subsequent recording;

making a transition in each of said recording channels regarding signal samples available thereto from samples of said first sequence to samples of said second sequence in such a way that said transition occurs in said first recording channel before the transition occurs in said second recording channel and the time span between said respective transitions in said first and second channels extends over a multiplicity of sampling intervals of said signal sequences;

modifying the values of said coded samples during said time span by progressively reducing the successive samples of said first sequence from a nominal to a minimum value and reducing the values of the successive samples of said second sequence by a progressively declining reduction factor so that during said time span said samples of said

second sequence progessively increase from a minimum value to a nominal value;

forming, during said time span, interplated-value sample value signals between each of the successive samples, of both said first and second sequences, respectively distributed to said first and second channels;

inserting said interpolated value sample signals between successive sample value signals of the sequence in the channel to which said sample values are distributed, and

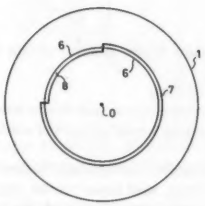
in the reproduction of the signals from said recording channels, combining the signals to the two recording channels to provide the basis of a reproduced sound signal, the combination being performed with averaging of said interpolated values with the contemporary values of the other sequence participating in the splicing method during each said time span.

4,555,738

HEAD ADJUSTING DISK

Noriaki Murayama, and Kiyoto Abe, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jan. 13, 1984, Ser. No. 570,302
Claims priority, application Japan, Jan. 13, 1983, 58-2168[U]
Int. Cl.⁴ G11B *21/00*
U.S. Cl. 360—75 **4 Claims**



1. In a head adjusting disk which has first and second head position adjusting record tracks formed thereon in concentrical relationship around the center of rotation thereof in order to enable adjustment of the position of a head to be adjusted by comparing amplitude of reproduction signals obtained by scanning for reproduction of said first and second head position adjusting record tracks with the head to be adjusted, the improvement wherein said first and second head position adjusting record tracks are formed such that an outer circumferential edge of one of said first and second head position adjusting record tracks and an inner circumferential edge of the other of said first and second head position adjusting record tracks extend along a same circumference and that one of said first and second head position adjusting record tracks is formed to extend along a portion of one n'th (where $n>1$ and $n\neq 2$) of the circumference while the other of said first and second head position adjusting record tracks is formed to extend along the remaining $(1-1/n)$ portion of the circumference, whereby individual signals reproduced from said first and second head position adjusting record tracks can be distinguished from each other by difference in duration thereof.

4,555,739

SEMI SELF-LOADING FERRITE HEAD

Dien Le Van, San Jose, Calif., and Jesse T. Wallace, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1982, Ser. No. 444,767
Int. Cl.⁴ G11B *5/60, 21/20*
U.S. Cl. 360—103 **8 Claims**

1. An air bearing magnetic head slider assembly for supporting

a transducer comprising:

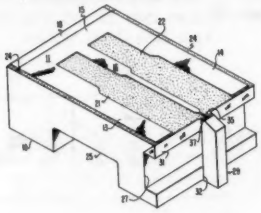
a substantially rectangular planar support having leading and trailing edges and including:

a pair of coplanar outer rails;

a middle rail positioned between and substantially coplanar with respect to said pair of rails;

a cross rail interconnecting and coplanar with said pair of rails and said middle rail;

said middle rail and said cross rail defining respectively with said pair of rails, a pair of recesses each enclosed on three



sides by said rails and extending rearwardly from said cross rail to said trailing edge whereby, a negative pressure region is established at said recesses and a positive pressure region is established adjacent said rail surfaces causing said support to fly in close proximity to a confronting planar surface at a substantially constant height; and

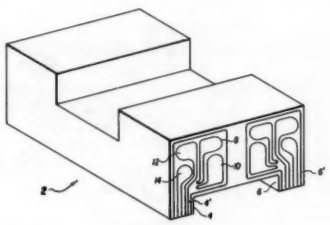
a transducer gap formed transversely in said middle rail adjoining said trailing edge.

4,555,740

THIN FILM TRANSDUCER HEAD FOR INDUCTIVE RECORDING AND MAGNETORESISTIVE READING

Bruce J. Jackson; Ralph F. Simmons, both of Boise, and Mike L. Covault, Eagle, all of Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 4, 1983, Ser. No. 482,654
Int. Cl.⁴ G11B *5/12*
U.S. Cl. 360—113 **11 Claims**



1. A thin film transducer for inductively recording and magnetostrictively reading magnetic information comprising:

A non-magnetic substrate a first thin film yoke member of magnetic material disposed on a surface of said substrate; a thin film magnetoresistive element insulatingly mounted on said first yoke member and having means for defining a single magnetic domain in a predetermined portion thereof; a thin film read conductor of electrically conductive material disposed over said magnetoresistive element and having a transducer gap therein whose sides are at an acute angle with respect to the principle longitudinal axis thereof and overlying said magnetic domain in said magnetoresistive element; a thin film write conductor of electrically conductive material insulatingly disposed on and in substantial alignment with said read conductor; and a second thin film yoke member of magnetic material insu-

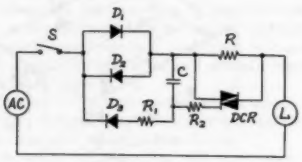
latingly disposed on said write conductor and overlying said transducer gap in said read conductor.

4,555,741

DEVICE FOR ELIMINATING INRUSH-CURRENT

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Jun. 1, 1984, Ser. No. 616,166
Claims priority, application Japan, Jun. 14, 1983, 58-104867
Int. Cl.⁴ H02H *9/02*
U.S. Cl. 361—58 **9 Claims**



1. A device for eliminating inrush-current, comprising the components of a power switch, a thyristor, pair of diodes in reverse parallel, a resistance, a rectifier and a time constant circuit,

(1) the switch, pair of diodes and resistance being connected in series;

(2) the thyristor being connected to the resistance in parallel;

(3) one terminal of the diode pair being connected to the time constant circuit through the rectifier; and

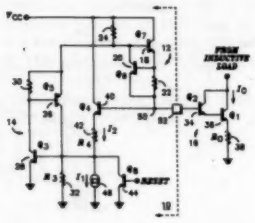
(4) the time constant circuit being connected to the gate of the thyristor.

4,555,742

SHORT DETECTION CIRCUIT AND METHOD FOR AN ELECTRICAL LOAD

Randall C. Gray, Scottsdale, and Robert B. Jarrett, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1984, Ser. No. 608,335
Int. Cl.⁴ H02H *3/08*
U.S. Cl. 361—93 **5 Claims**



1. A short detection circuit for operatively controlling current in an electrical load connected to a source voltage line comprising:

means for driving an electrical load having first, second and third terminals thereof, said first terminal being connected to said electrical load and said second terminal being connected to a common voltage line; and

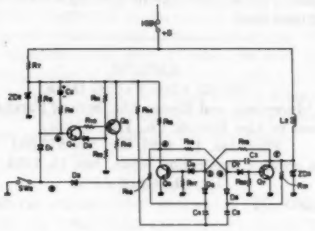
means for detecting a short circuit current in said electrical load connected to said third terminal of said driving means, said means for detecting comprising a current source for providing an operating current to said driving means and an SCR for disabling said current source in response to a shorted condition of said electrical load, said detecting means selectively withholding and providing said operating current to said driving means when a shorted and not shorted condition of said electrical load to said source voltage line is respectively detected at said third terminal of said driving means.

4,555,743

TIMER CIRCUIT

Sadao Kokubu; Masatoshi Hirano, and Takao Sakakibara, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jul. 22, 1983, Ser. No. 516,363
Claims priority, application Japan, Jul. 27, 1982, 57-112865[U]
Int. Cl.⁴ H01H *47/18*
U.S. Cl. 361—196 **1 Claim**



1. A rear window heater control circuit for an automobile, comprising:

a power source switch;

a first transistor connected to said power source switch so as to become conductive when said power source switch is turned on;

a timer circuit provided between said power source switch and said first transistor, said timer circuit including a capacitor and a resistor, said first transistor having a base connected to said timer circuit;

a second transistor arranged to become conductive when said first transistor becomes conductive;

a bistable circuit including a third transistor and a fourth transistor, said third transistor having a base receiving a bias current from said second transistor;

a normally open momentary switch having a first terminal which is grounded, and a second terminal connected to said power source switch;

a first diode connected between said power source switch and said normally open momentary switch, said first diode having an anode connected to said connection between the base of said first transistor and said time circuit;

a second diode having a cathode connected to said connection between said normally open momentary switch and said first diode and an anode connected to said power source switch;

a relay having a first end connected to said power source switch, and a second end connected to a collector of said fourth transistor,

whereby conductivity of said third transistor and said fourth transistor is reversed to energize said relay upon closing of said normally open switch while said timer circuit starts discharging.

4,555,744

STORAGE CABINET

Ralf P. Maroney, and Gregory A. Fishkind, both of Milford, Conn., assignors to Plug-In Storage Systems, Inc., Milford, Conn.

Filed Aug. 28, 1984, Ser. No. 645,054
Int. Cl.⁴ H05K *7/14*
U.S. Cl. 361—212 **19 Claims**

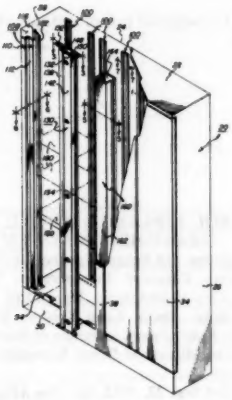
1. A storage cabinet for circuit board modules comprising:

a housing;

a plurality of electrically conductive brackets extending longitudinally in spaced relation in said housing, each of said brackets including

a surface connected to said housing, a longitudinal slot and a hollow interior behind said slot,

at least one pair of shelves of conductive material slidably mounted for adjustable movement relative to said brackets and each other in each of said slots, each of said shelves including



a series of grooves extending substantially perpendicular to said brackets on the top and bottom surface of each of said shelves,

the grooves on each adjacent pair of shelves slidably disposed on said brackets being in registration with each other for receiving a circuit board module therebetween, and

means attached to said cabinet for electrically grounding the cabinet.

4,555,745

THICK-FILM CAPACITOR MANUFACTURED BY PRINTED-CIRCUIT TECHNIQUES

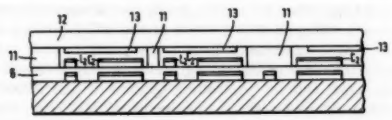
Gisela Westermeir, Hohenroth, and Friedhard Fehr, Lauter, both of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,519

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143995

Int. Cl.[4] H01G *4/20*; B05D *5/12*

U.S. Cl. 361—320 **16 Claims**



1. Thick film capacitor implemented by printed-circuit technology, comprising a substrate, a substantially planar base electrode positioned on said substrate, a thick-film dielectric which covers said base electrode and defines an upper surface which is substantially parallel to said base electrode, and a substantially planar counter-electrode positioned on said dielectric surface, in alignment with said base electrode, wherein said dielectric is composed of a screen-printable dispersion of dielectric filler substances in a polymeric material which can be cured at comparably low temperatures.

4,555,746

ORGANIC CHIP CAPACITOR

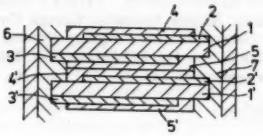
Hideaki Mochizuki, Higashiosaka, and Tooru Tamura, Ikeda, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 11, 1984, Ser. No. 570,028

Claims priority, application Japan, Jan. 12, 1983, 58-3671; Jan. 12, 1983, 58-3672; Jan. 12, 1983, 58-3673

Int. Cl.[4] H01G *4/08, 1/14*

U.S. Cl. 361—323 **8 Claims**



1. A chip film capacitor capable of being directly soldered comprising a laminate of one or more assemblies, each assembly comprising the following layers (a) to (d):

(a) a layer of heat resistant film which is not meltable or extremely deformable at a temperature of 260° C.,

(b) vapor coated metal electrodes provided on a portion of opposite major surfaces of said heat resistant film,

(c) a heat resistant dielectric film provided on said vapor coated metal electrodes and containing said heat resistant film where it is not coated by said electrodes,

(d) common metal electrodes formed at the side of said laminated layer and containing said vapor coated metal electrodes, wherein said common metal electrodes are comprised of a first metal layer formed at both sides of said laminated layer by plasma sprying and having good adhesion to said heat resistant films and a second metal layer formed on said first metal layer by arc spraying or gas spraying and said second metal layer having good solderability.

4,555,747

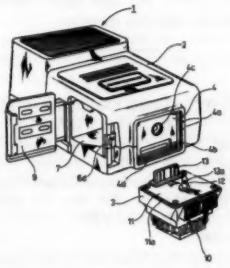
COUPLING MECHANISM OF PHOTOGRAPHIC FLASH DEVICE

Yuzo Tsuruta, Kanagawa, Japan, assignor to Kabushiki Kaisha Sunpak, Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 302,257

Int. Cl.[4] G03B *7/099, 15/05*

U.S. Cl. 362—3 **14 Claims**



1. Photoflash apparatus, comprising: a flash unit including a main body, an adapter unit for mounting between said main body of said flash unit and a camera, and coupling means for securing said adapter unit to one end of said main body, said

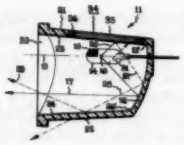
coupling means comprising interengageable mounting structures at said one end of said body and on said adapter unit, one of said interengageable mounting structures including a central projecting pin and the other of said mounting structures including a wall having a central opening through which said pin extends when said mounting structures are engaged, and a locking member operable to a locked position to engage said pin and lock said members together with said mounting structures being stressed in a manner such that said flash unit and said adapter unit are held tightly together and to hold said locking member in said locked position.

4,555,748

TRUNCATED MOTOR VEHICLE HEADLAMP

Irving Bradley, Russell Township, Geauga County, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 437,424, Oct. 28, 1982, abandoned.
This application Jan. 22, 1985, Ser. No. 693,816
Int. Cl.[4] F21V *29/00, 7/00*
U.S. Cl. 362—61 **6 Claims**



1. An improved vehicle headlamp for forward illumination substantially devoid of upwardly directed glare light comprising a concave parabolic enclosed reflector truncated at opposite sides thereof to provide top and bottom flat sections substantially parallel to each other and to the optical axis of a curved portion of the reflector, both of said top and bottom sections being non-reflective and with said top section being substantially closer to said optical axis than said bottom section, a single filament light source contained within said reflector, said light source being enclosed within a bulb, said filament also being devoid of shield means blocking its light rays from being projected to the curved portion of the reflector member, and said light source being positioned substantially on said optical axis and frontwardly of the junctions of said generally flat truncated sections with the reflecting section of the reflector at least in the vicinity of the vertical plane in which the light source lies, wherein the improvement comprises having said reflector formed with a thermoplastic synthetic organic polymer and having a planar metal member forming a part of the flat section above the light source which removes heat from the enclosed reflector member.

4,555,749

LED CIRCUIT BOARD INDICATOR HOUSING AND TIE-BAR ASSEMBLY

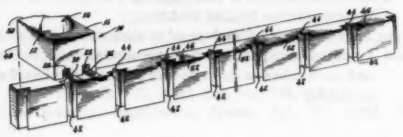
Gary L. Rifkin, Gurnee; Charles C. Lawrence, Chicago; Sam Zilber, Skokie, and Michael Hamby, Chicago, all of Ill., assignors to General Instrument Corporation, New York, N.Y.

Filed May 7, 1984, Ser. No. 607,673
Int. Cl.[4] F21V *21/14*
U.S. Cl. 362—249 **9 Claims**

1. The assembly of at least one circuit board indicator lamp housing and a tie-bar for mounting a plurality of said lamp housings, said assembly comprising:

a plurality of dove-tail channels provided at spaced locations along the length of said tie-bar, and

said housing including a complementary shaped dove-tailed channel on a surface thereof adapted to be slidingly received between one half



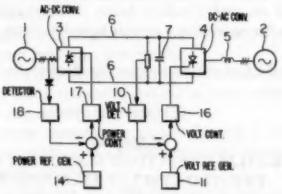
of each of an adjacent pair of said spaced tie-bar dove-tail channels.

4,555,750

CONTROL APPARATUS FOR D.C. POWER TRANSMISSION SYSTEM

Susumu Matsumura, c/o Sohgo Gigyutsu Kenkyusho of Kansai Electric Power Company Incorporated, No. 1, Nakohji, Ichinotsubo, City of Amagasaki, Hyogo Pre, Japan; Yasuhiko Hosokawa, Kobe, Japan; Kanji Katsuki, Kobe, Japan, and Masao Yano, Kobe, Japan, assignors to Susumu Matsumura, Amagasaki and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sep. 22, 1982, Ser. No. 421,574
Claims priority, application Japan, Sep. 22, 1981, 56-149890; Sep. 22, 1981, 56-149891
Int. Cl.[4] H02M *5/45*
U.S. Cl. 363—37 **5 Claims**

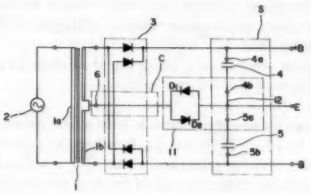


1. In an apparatus for controlling a D.C. power transmission system having a line-commutated converter which is connected between a first A.C. system and D.C. power transmission lines and which performs power conversion between A.C. power and D.C. power, and also having a forced-commutated converter which is connected between said D.C. power transmission lines and a second A.C. system and which performs power conversion between D.C. power and A.C. power; a control apparatus for a D.C. power transmission system comprising a voltage detector which detects a D.C. voltage of said D.C. power transmission lines, a first control means for comparing an output of said voltage detector with a voltage reference signal and for controlling ignition of said forced-commutated converter in accordance with said comparison, a current detector which detects a current proportional to a conversion power of said line-commutated converter, and a second control means for comparing an output of said current detection with a power reference signal and for controlling ignition of said line-commutated converted in accordance with said comparison, whereby said two converters may be remotely located from each other and electrically connected by only a D.C. transmission line since a separate feedback wire is not required between said first and second control means.

4,555,751
RECTIFIED AND SMOOTHED DC SUPPLYING CIRCUITRY

Yoshiro Koga, Ashiya, and Kenji Nakao, Neyagawa, both of Japan, assignors to Onkyo Kabushiki Kaisha, Neyagawa, Japan

Filed Mar. 31, 1983, Ser. No. 480,804
Claims priority, application Japan, Apr. 2, 1982, 57-48770[U]
Int. Cl.⁴ H02M 1/12
U.S. Cl. 363—44 **7 Claims**



1. A rectified and smoothed DC supply circuit for use with an audio amplifier which amplifies input audio signals, said DC supply circuit comprising:

a power source transformer having primary and secondary windings;

a rectifying circuit for rectifying an AC output from said secondary winding of said power source transformer;

a smoothing circuit consisting of positive-side and negative-side smoothing capacitors connected in series;

a center-tap lead circuit of said secondary winding coupled to said smoothing circuit;

a bidirectional switching circuit, having predetermined threshold values, coupling said smoothing circuit and said center-tap lead circuit, and provided for conducting charging current between said smoothing circuit and said center-tap lead circuit when the voltage at connecting points between said center-tap lead circuit and said smoothing circuit exceeds said predetermined thresholds;

first and second output terminals, said first output terminal coupled between a first output terminal of said secondary winding and said positive-side smoothing capacitor, and said second output terminal coupled between a second output terminal of said secondary winding and said negative-side smoothing capacitor, said first and second output terminals being connected to said audio amplifier.

4,555,752
AC POWER CONVERTER WITH COMMUTATION CIRCUIT FOR REDUCING REACTIVE POWER

Ryoichi Kurosawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1984, Ser. No. 613,730
Claims priority, application Japan, May 31, 1983, 58-96129
Int. Cl.⁴ H02M 7/757
U.S. Cl. 363—68 **20 Claims**

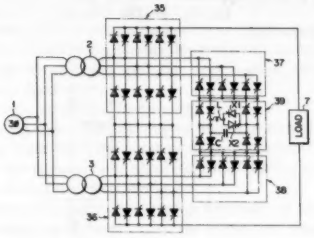
1. A power converter comprising:

power source means for supplying a first AC power and a second AC power which is isolated from the first AC power;

thyristor bridge means coupled to said power source means, for converting said first and second AC power into a given converted power which is supplied to a load of the power converter;

a first thyristor circuit coupled to said power source means and including plural first auxiliary thyristors each having two terminals between which a current path is formed, one terminal of each of said first auxiliary thyristors receiving said first AC power and the other terminal of each of said first auxiliary thyristors being coupled to a first node;

a second thyristor circuit coupled to said power source means and including plural second auxiliary thyristors each having two terminals between which a current path is formed, one terminal of each of said second auxiliary thyristors receiving said second AC power and the other terminal of each of said second auxiliary thyristors being coupled to a second node; and

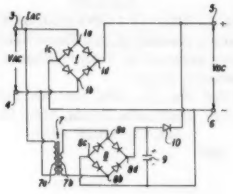


commutation circuit means coupled between said first and second nodes, for commutating at least a part of a current flowing through said thyristor bridge means to the current path of said first and second thyristor circuits.

4,555,753
RECTIFIER CIRCUIT WITH TWO RECTIFIERS

Makoto Takahashi, Tottori, Japan, assignor to TDK Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,269
Claims priority, application Japan, Oct. 28, 1982, 57-188240
Int. Cl.⁴ H02M 7/06
U.S. Cl. 363—126 **7 Claims**



1. A rectifier circuit for producing an output DC voltage from an input AC voltage, comprising:

(a) a first full wave rectifier connected directly to said input AC voltage for rectifying the same, said first rectifier output being connected to a first pair of output termionals to provide an unfiltered output DC voltage;

(b) a voltage reducing means connected to said input AC voltage for providing a voltage-reduced AC output;

(c) a second full wave rectifier connected to said voltage-reduced AC output for rectifying the same to provide at a second pair of output terminals a reduced voltage DC output;

(d) a smoothing capacitor connected across said second pair of output terminals; and

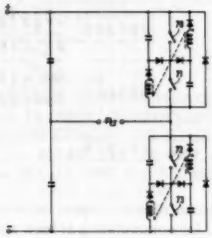
(e) means connecting said first and second pair of output terminals including unidirectional current means whereby the combined DC voltage output during each half cycle of said input AC voltage has a peak value equal to the peak voltage of said unfiltered DC voltage and a minimum value equal to said reduced voltage DC output.

4,555,754

EQUALIZER CIRCUIT FOR SWITCHES CONNECTED IN SERIES

Bernard Hennevin, Decines, France, assignor to Compagnie Electro-Mecanique, Paris, France

Filed May 30, 1984, Ser. No. 615,450
Claims priority, application France, May 30, 1983, 83 08891
Int. Cl.⁴ H02M 7/537
U.S. Cl. 363—132 **5 Claims**



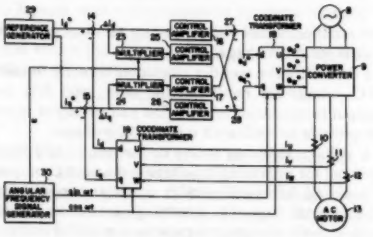
1. An equalizer circuit for a plurality of switches connected in series between a voltage source and a load, each of said switches being connected in parallel with a respective equalizing capacitor via a respective diode, the improvement comprising a transformer having a plurality of windings, each of said windings being connected in series with a respective diode, and each of said switches having a respective winding-diode series connection connected in parallel therewith, whereby electrical energy initially stored in the capacitors is transferred for storage in magnetic form to the windings when the switches are closed and is re-used when the switches are opened to accelerate charging of the less charged capacitors until all the capacitors reach the voltage of the most charged capacitor.

4,555,755

AC CURRENT CONTROL SYSTEM

Ryoichi Kurosawa, Kokubunji, and Takeo Shimamura, Hachioji, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 15, 1984, Ser. No. 589,998
Claims priority, application Japan, Mar. 16, 1983, 58-42349
Int. Cl.⁴ H02P 13/30
U.S. Cl. 363—160 **3 Claims**



1. An AC current control system for controlling multi-phase AC currents supplied from a power converter to a multi-phase load, said system comprising:

current detector means detecting said currents and producing signals indicative of the detected multiphase current values,

first coordinate transformer means transforming the detected multi-phase current values into orthogonal two-axis current values i_d and i_q in a rotating coordinate rotating at an angular frequency ω,

means providing two-axis current reference values i_d^* and i_q^* for the current values i_d and i_q,

means receiving the current values i_d and i_q, and the current reference values i_d^* and i_q^*, and determining two-axis voltage values e_d^* and e_q^*, and

second coordinate transformer means transforming the two-axis voltage values e_d^* and e_q^* into multiphase voltage reference values,

said multi-phase voltage reference values being used for determining multi-phase output voltages of the power converter, and

said angular frequency ω being equal or close to an angular frequency of the AC currents,

wherein

the voltage value e_d^* contains at least a first quantity proportional to a first deviation Δi_d between the current value i_d and the current reference value i_d^*, a second quantity proportional to an integral of the first deviation Δi_d and a third quantity proportional to an integral of a product of the angular frequency ω and a second deviation Δi_q between the current value i_q and the current reference value i_q^* and

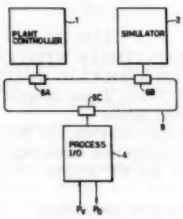
the voltage value e_q^* contains at least a fourth quantity proportional to the second deviation Δi_q, a fifth quantity proportional to an integral of the second deviation Δi_q and a sixth quantity proportional to an integral of a product of the angular frequency ω and the first deviation Δi_d.

4,555,756

PLANT CONTROLLER SIMULATOR WITH STRUCTURE FOR COMBINING SIMUATION SIGNALS WITH ACTUAL PROCESS I/O SIGNALS

Kimio Yamanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,658
Claims priority, application Japan, Nov. 12, 1981, 56-182530
Int. Cl.⁴ G05B 17/00
U.S. Cl. 364—130 **5 Claims**



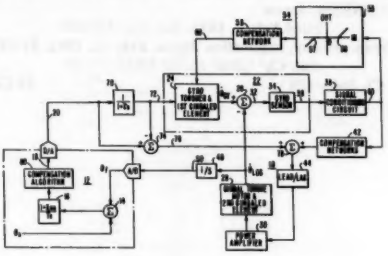
1. A simulation system for performing simulation of a plant controller, comprising; an input/output device for interfacing process input/output signals, a data path for transmitting said process input/output signals, at least three stations inserted in the said data path, each including input/output buffer memories, said plant controller being connected to said data path through one of said stations, an output signal from the plant controller being transmitted via the output buffer memory of said one station, the data path and the input buffer memory of another of said stations, and simulator means for supplying a simulating signal to said plant controller through the output buffer memory of a further station coupled to said simulator means, the data path and the input buffer memory of said one station.

4,555,757

INTERFACE SYSTEM FOR HYBRID CONTROL LOOPS

William J. Dorman, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 5, 1983, Ser. No. 492,061
Int. Cl.[4] G05B *11/00*
U.S. Cl. 364—165 **10 Claims**



1. A system for interfacing a digital computer with at least one analog gimbal control loop, said computer being operative to provide a rate command signal to said analog gimbal control loop to govern the rate output of said analog control loop, said rate command signal being stepwise updated at time intervals designated by said computer to converge the rate output of said analog control loop to a desired rate, said interface system comprising:

means for filtering said rate command signal of said computer to provide a filtered rate command signal to said analog gimbal control loop;

means for generating a feed-forward aiding signal as a function of the rate of change of said filtered rate command signal to further govern said analog gimbal control loop; and

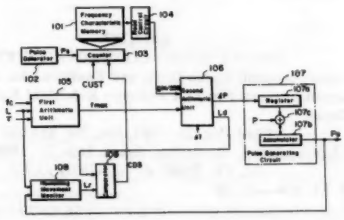
means for compensating said rate command signal for the operation of said filtering means to render the average rate output of said analog gimbal control loop during the time intervals between computer rate command signal updates to be substantially that desired.

4,555,758

METHOD AND APPARATUS FOR CONTROLLING THE ACCELERATION AND DECELERATION OF A MOVABLE ELEMENT WITHOUT ABRUPT CHANGES IN MOTION

Hajimu Inaba, Hino, and Shinsuke Sakakibara, Komae, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Mar. 3, 1983, Ser. No. 471,474
Claims priority, application Japan, Mar. 8, 1982, 57-036184
Int. Cl.[4] G06F *15/46;* G05B *19/18*
U.S. Cl. 364—174 **5 Claims**



1. A method of controlling, in an apparatus including a memory, an access means and a computing means, acceleration of the frequency at the beginning of a pulse train and the deceleration of the frequency at the end of the pulse train, comprising the steps of:

storing a frequency function in a memory in advance, which frequency function represents an acceleration characteristic having minimum initial acceleration during an acceleration period and deceleration characteristic having minimum initial deceleration during a deceleration period;

reading the frequency function out of the memory via the access means at predetermined time intervals, which frequency function represents the acceleration characteristic during acceleration and the deceleration characteristic during deceleration;

receiving a command frequency;

computing using the computing means, a frequency of the pulse train from the product of the command frequency and the frequency at specified times during acceleration and during deceleration; and

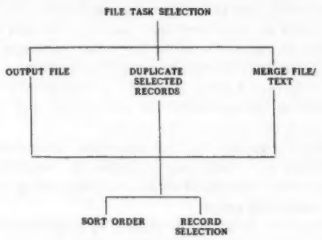
generating the pulse train having a number of pulses corresponding to the product of the computed frequency and the predetermined time interval, during said predetermined time interval.

4,555,759

SELECTIVE USE OF RESTORED FILE SETUPS

Rex A. McCaskill; John W. McInroy, and Paul D. Waldo, all of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,794
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—300 **35 Claims**



1. A method for utilizing stored file setups in a word processing system having a processor, keyboard, display and a storage medium, comprising the steps of:

(a) prompting an operator to select, via said keyboard, a specified task to be performed on a file from a task menu displayed on said display;

(b) displaying on said display a current frame for the specified task;

(c) prompting the operator to input, via said keyboard, a name of a previous file setup stored on the storage medium while the current frame is being displayed;

(d) determining positively or negatively whether the previous file setup contained frames in a hierarchy of the current frame; and

(e) copying the stored information in the frames of the previous file setup into frames in the hierarchy of the current frame to produce an updated setup of restored frames when a result in step (d) is positive.

4,555,760

METHOD AND COMPUTER TOMOGRAPHY DEVICE FOR DETERMINING A TOMOGRAPHIC IMAGE WITH ELEVATED RESOLUTION

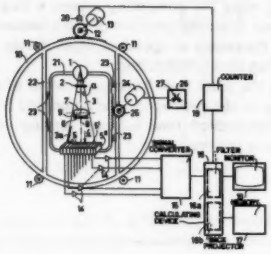
Johannes C. A. Op de Beek, and Steven Lobregt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1983, Ser. No. 491,516

Claims priority, application Netherlands, May 12, 1982, 8201942

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—414 **3 Claims**



1. In a method of computed tomography which comprises the steps of:

irradiating a plane through a body with a flat, fan-shaped beam of penetrating radiation which lies in the plane, the beam being sequentially directed through the body from a plurality of source points which are uniformly distributed around the body on a circle which lies in the plane;

measuring the values of the attenuation of the radiation along a plurality of measuring paths which lie in the beam and diverge from each of the source points, each of the measuring paths subtending an angle $\Delta\psi$, a centermost measuring path in the beam having a center line and being disposed so that from each source point said center line forms an angle ψ_i with the line which connects the center of the circle to the source point, the centermost measuring path further having a width, a, measured along a line which is perpendicular to the center line and passes through the center of the circle;

forming subgroups of the measured attenuation values wherein each subgroup includes all attenuation values which were measured along a corresponding set of parallel measuring paths;

filtering each subgroup of values, by either convolution or Fourier transformation, followed by frequency filtering and Fourier back-transformation;

and then backprojecting the filtered values into an image matrix; the improvement wherein:

each subgroup of values includes only values which were measured in a single direction along parallel measuring paths;

for each of the subgroups of values there is a corresponding subgroup of values which were measured in the opposite direction along parallel paths;

within each subgroup the distance between two adjacent measuring paths is greater than a/2 and less than or equal to a;

the filtering step comprises filtering the values with a filter which has a transfer function response having a maximum value at the frequency $(2a)^{-1}$ and zero points at frequencies 0 and 1/a; and further including the step of

interleaving values from the pairs of corresponding subgroups after the filtering step and before the backprojection step; and

the backprojection step includes backprojecting the interleaved data from each pair of corresponding subgroups and is performed with an interpolation distance of a/2.

4,555,761

DIRECTION DETECTION FOR A VEHICLE

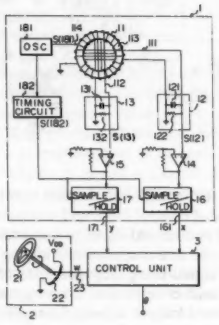
Muneaki Matsumoto, Okazaki; Akira Kuno, Obu, and Koji Numata, Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 9, 1983, Ser. No. 465,188

Claims priority, application Japan, Feb. 12, 1982, 57-19794

Int. Cl.[4] G06F *15/50*; G01C *17/28*

U.S. Cl. 364—424 **18 Claims**



7. A device for detecting a running direction of a vehicle, comprising:

direction detection means attached to said vehicle for detecting the direction of the terrestrial magnetic field;

turning angle detection means for detecting the turning angle of said vehicle;

first calculation means, receiving said detection from said direction detection means, for calculating successively the running direction of said vehicle;

memory means for storing said running direction calculated in said first calculation means;

second calculation means for determining the change in said running direction on the basis of said running direction calculated in said first calculation means and said running direction stored in said memory means, and for determining whether the relationship between said determined change in said running direction and variation in said detected vehicle turning angle is not within a predetermined relationship, and for determining an abnormality of said terrestrial magnetic field direction detection when the result of said relationship determination is affirmative; and

means for prohibiting updating of data in said memory means when said abnormality is determined by said second calculation means.

4,555,762

ENGINE SPEED CONTROL SYSTEM

Masaaki Ohgami; Kazuo Hara, and Kunihiro Abe, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 334,060

Claims priority, application Japan, Dec. 27, 1980, 55-187185

Int. Cl.[4] B60K *41/02*; G05D *13/02*

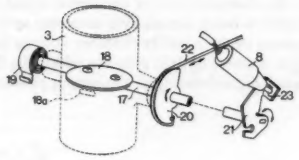
U.S. Cl. 364—431.09 **17 Claims**

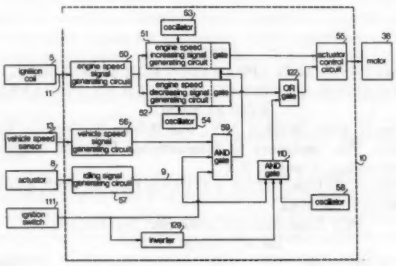
1. In a system for controlling the idling speed for an internal combustion engine mounted on a vehicle, said engine having an induction passage and a throttle valve in said induction passage, an improvement comprising:

ignition switch means for producing an ignition switch signal when said ignition switch means is opened;

actuator means, upon occurrence of said ignition switch signal, for undergoing movement for operatively moving said throttle valve into a closed position closing said induction passage;

sensing switch means for producing a closed throttle valve position signal when said throttle valve reaches said closed position; and





means responsive to said closed throttle valve position signal for stopping the movement of said actuator means substantially when said throttle valve reaches said closed position, whereby movement of said actuator means is minimized and the engine is prevented from running on after the ignition switch means is opened.

4,555,763

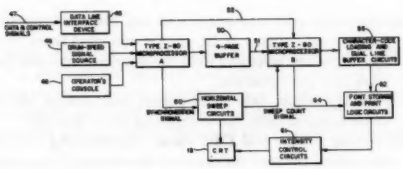
METHOD AND APPARATUS FOR STORAGE AND ACCESSING OF CHARACTERS, AND ELECTRONIC PRINTER EMPLOYING SAME

Jerome R. Dahme, Berwyn, Pa., assignor to Decision Data Computer Corp., Horsham, Pa.

Filed Jul. 1, 1982, Ser. No. 394,436

Int. Cl.[4] G06F *3/14;* **B41B** *19/00*

U.S. Cl. 364—521 **28 Claims**



24. In the electronic printing of characters, the method of storing, accessing and displaying character-representing information as to a plurality of different characters, in and from a computer memory, comprising:

(a) permanently storing said character-representing information in the form of sets of an integral number of bytes, at least some of said sets containing a combination of 6-bit and 8-bit bytes and representing the character information for a particular slice through a particular character and being separately addressable according to the character and slice which it represents, the number of 6-bit bytes and the number of 8-bit bytes used to represent each slice being selected to equalize the number of bits in the set with the number of bits in the corresponding character slice;

(b) selectively addressing each of said sets of bytes according to the character and slice which it represents, to read out the corresponding character-slice bytes, and

(c) displaying said read-out bytes along a scan of a scanning type of image-display device to reproduce the character information corresponding to the read-out set of bytes.

4,555,764

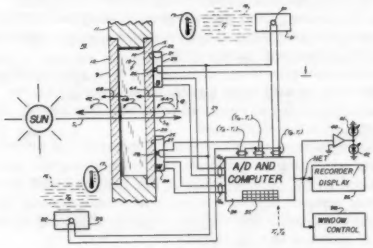
NET ENERGY TRANSFER MEASUREMENT METHODS, APPARATUS AND SYSTEMS WITH SOLAR ENERGY AND CONTROL APPLICATIONS

Thomas H. Kuehn, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 23, 1981, Ser. No. 334,513

Int. Cl.[4] G01K *7/00*

U.S. Cl. 364—557 **16 Claims**



16. A method for instrumenting fenestrations for measuring net energy transfer therethrough, each said fenestration having first and second surfaces separating regions having ambient temperatures T_1 and T_2 respectively, said ambient temperatures T_1 and T_2 having auxiliary measurements made of them, wherein the method comprises

providing and locating a thermocouple in the region having ambient temperature T_1;

providing a plurality of additional thermocouples and heat flux sensors corresponding to each said fenestration, each said plurality comprising first and second thermocouples differentially connected with said T_1 thermocouple for providing three temperature difference outputs, and each said plurality further comprising first and second heat flux sensors providing respective heat flux sensor electrical outputs and having different absorptivities to light;

mounting as a combination said first thermocouple of each said plurality in thermal contact with said first heat flux sensor of each said plurality respectively on said first surface of each said corresponding fenestration;

mounting as a combination said second thermocouple of each said plurality in thermal contact with said second heat flux sensor of each said plurality respectively on said first surface of each said corresponding fenestration;

analog-to-digitally converting said respective heat flux sensor electrical outputs and two of the three temperature difference outputs for each said plurality to digital representations;

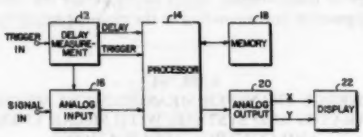
electronically storing said auxiliary measurements of temperatures T_1 and T_2; and

electronically computing and providing physical representations of net energy transfer respectively corresponding to said fenestrations utilizing all of said digital representations and said stored auxiliary measurements.

4,555,765
MULTI-MODE OSCILLOSCOPE TRIGGER WITH COMPENSATING TRIGGER DELAY

Arthur W. Crooke, Concord, and Edwin E. Stebbins, Boston, both of Mass., assignors to Analogic Corporation, Peabody, Mass.

Filed Sep. 14, 1982, Ser. No. 418,186
Int. Cl.[4] H01J *29/56*; G01R *23/16*
U.S. Cl. 364—571 **10 Claims**



6. Apparatus to synchronize a digital oscilloscope displaying an input signal comprising:

a clock providing periodic sample times;

comparator means providing a trigger output signal when a trigger signal crosses a predetermined threshold;

time measuring means providing a delay signal corresponding to the time interval between said trigger output signal and a subsequent sample time;

sample means providing representative sample signals corresponding to said input signals at said sample times;

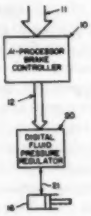
storage means for storing said representative sample signals and said delay signal; and

signal adjustment means providing interpolated sample signals according to previous said sample signals and said stored delay signals, wherein the resulting said interpolated sample signals correspond to subsequent sample signals having a delay signal equal to the delay signal of said previous sample signal.

4,555,766
BRAKE CONTROL SYSTEM FOR VEHICLES

Eric Wright, Watertown, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 9, 1981, Ser. No. 310,187
Int. Cl.[4] F15B *9/03*
U.S. Cl. 364—426 **3 Claims**



1. A brake control system for vehicles comprising fluid braking means, a microprocessor having input brake control means and output fluid brake application means, the output fluid brake application means comprising means responsive to a digital signal characteristic of a desired fluid braking pressure, wherein the brake application means comprises improved fluid pressure regulating means comprising;

(a) fluid pressure chamber means for developing and maintaining a regulated braking fluid pressure,

(b) valve means having a spool selectively operable axially to select brake application, release and lap positions for selectively governing fluid pressure in the braking means and in the fluid pressure chamber,

(c) digital linear actuating means comprising a stepping motor having axially operable shaft means coaxially connected to one end of the spool of the valve means and responsive to the digital signal to actuate the spool axially alternately to application and release brake control positions,

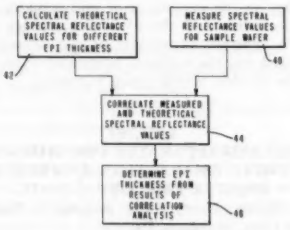
(d) control means including the valve means and a piston carrying the stepping motor operable responsive to changes of fluid pressure in the chamber for maintaining output pressure to the fluid braking means in accordance with the characteristics of the digital signal, and

(e) the piston being biased by a metering spring to permit expansion of the pressure chamber volume in accordance with an increase of fluid pressure within the fluid pressure chamber corresponding to the output pressure.

4,555,767
METHOD AND APPARATUS FOR MEASURING THICKNESS OF EPITAXIAL LAYER BY INFRARED REFLECTANCE

William R. Case, Walden, N.Y., and Wildey E. Johnson, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US82/00729, § 371 Date Oct. 28, 1982, § 102(e) Date Oct. 28, 1982
PCT Filed May 27, 1982, Ser. No. 442,193
Int. Cl.[4] G01B *11/02*
U.S. Cl. 364—563 **14 Claims**


CALCULATE THEORETICAL SPECTRAL REFLECTANCE VALUES FOR DIFFERENT EPI THICKNESS
MEASURE SPECTRAL REFLECTANCE VALUES FOR SAMPLE WAFER
CORRELATE MEASURED AND THEORETICAL SPECTRAL REFLECTANCE VALUES
DETERMINE EPI THICKNESS FROM RESULTS OF CORRELATION ANALYSIS

1. The method of measuring, by means of an instrument connected to a data processing system (DPS), the thickness of a sample epi layer grown on a substrate, comprising the steps of:

(a) operating said instrument and said DPS to measure the spectral reflectance of IR energy reflected from the surface of the epi layer and from the interface between the epi layer and the substrate;

(b) storing within said DPS values representing the measured spectral reflectance resulting from step (a);

(c) storing within said DPS values representing a series of theoretical spectral reflectances determined for a series of epi layers of different thicknesses within a range including the thickness of the epi layer being measured, said series of epi layers being of like doping concentrations;

(d) correlating within said DPS values for each of said theoretical spectral reflectances with values of said measured spectral reflectance and providing a quantitative measure of the degree of correlation as a function of epi layer thickness;

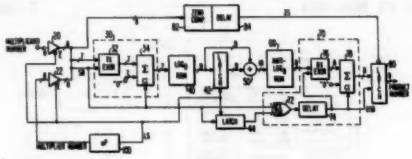
and (e) determining within said DPS the thickness of the sample epi layer from the maximum value of said quantitative measure of the degree of correlation.

4,555,768

DIGITAL SIGNAL PROCESSING SYSTEM EMPLOYING LOGARITHMS TO MULTIPLY AND DIVIDE

Henry G. Lewis, Jr., Hamilton Square, and Thomas M. Stiller, Ewing Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 7, 1983, Ser. No. 502,014
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—757 20 Claims



1. A digital signal processing system for processing digital numbers to produce processed digital numbers comprising:

first memory means for producing N-bit logarithms of said input digital numbers from a table of N-bit logarithms to a base B stored therein;

processing means coupled to said first memory means for digitally processing the N-bit logarithms of said inout digital numbers to produce processed N-bit logarithms; and

second memory means for producing from a table of antilogarithms to said base B stored therein said processed digital numbers in response to said processed N-bit logarithms;

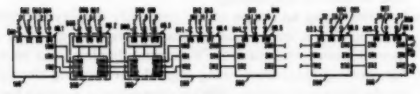
wherein said base B is selected in accordance with the magnitudes of said processed digital numbers to utilize substantially the entire range of possible magnitudes of said N-bit logarithms.

4,555,769

CIRCUIT APPARATUS FOR GENERATING MODULUS-N RESIDUES

Eric L. Carter, Endicott, and Harold T. Ward, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1983, Ser. No. 498,214
Int. Cl.[4] G06F 7/72
U.S. Cl. 364—746 11 Claims



1. Circuit apparatus responsive to a digital input signal indicative of a multiple bit number, said apparatus in response to said input signal providing a digital output signal indicative of the modulus-N residue of said input signal, where N is a predetermined odd integer greater than one, said apparatus comprising:

a current source,

an array of multiple modular groups, each said group having plural series-connected successive banks of plural semiconductor current switches, said switches of said banks of each said group having a predetermined cascode current logic tree network configuration,

each of said banks having predetermined signal responsive control means for controlling said switches of the particular said bank thereof, said control means of each one of said series-connected banks of the same group having a different response level with respect to the respective response levels of the other control means of the other banks of said same group,

said array further having N output circuit paths,

said input signal being received by predetermined ones of said control means of predetermined ones of said groups of said array, and in response to said input signal at said predetermined ones of said control means said switches of said array coact to selectively connect said circuit paths to said current source to provide a current condition in said circuit paths indicative of the numerical value of said modulus-N residue that is associated with the value of the number of said input signal present at said predetermined ones of said control means, and

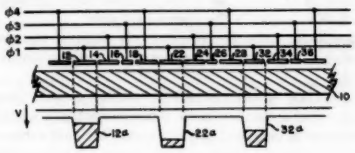
output means coupled to said circuit paths to provide said output signal thereat in accordance with said current condition of said paths.

4,555,770

CHARGE-COUPLED DEVICE GAUSSIAN CONVOLUTION METHOD

Jay P. Sage, Newton Centre, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 13, 1983, Ser. No. 541,820
Int. Cl.[4] G06G 7/12, 7/00, 7/02; H03H 19/00
U.S. Cl. 364—819 4 Claims



1. A method of operating a charge transfer device for producing the Gaussian convolution of a signal charge pattern stored therein, said charge transfer device having a semiconductor substrate in which pluralities of signal wells, mixing wells and interposed transfer wells are induced in regions situated below electrodes to which multiphase clock pulses are applied for the storage and selective transfer of signal charge packets, comprising the steps of:

(a) intermixing the charge stored in each of said plurality of mixing wells with the charge stored in the signal well disposed on a first side thereof by activating the interposed transfer well;

(b) isolating the charge stored in each of said plurality of mixing wells from the charge stored in the signal well disposed on said first side thereof by deactivating the interposed transfer well, whereby a fraction of said intermixed charge remains stored in each of said mixing wells;

(c) intermixing the charge stored in each of said plurality of mixing wells with the charge stored in the signal well disposed on a second side thereof by activating the interposed transfer well;

(d) isolating the charge stored in each of said plurality of mixing wells from the charge stored in the signal well disposed on a second side thereof by deactivating the interposed transfer well, whereby a fraction of said intermixed charge remains stored in each of said mixing wells; and

(e) repeating each of the above steps a sufficient number of times to achieve a Gaussian distribution of a desired width.

4,555,771

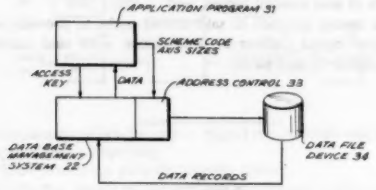
DATA PROCESSING SYSTEM FOR DATA BASE MANAGEMENT OF MATRIX TYPE DATA

Katsumi Hayashi, Ichikawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 328,935, Dec. 9, 1981, abandoned, which is a continuation of Ser. No. 69,762, Aug. 27, 1979, abandoned. This application Mar. 26, 1982, Ser. No. 362,449

Int. Cl.[4] G06F 5/00

U.S. Cl. 364—900 **1 Claim**



1. A data processing system for data base management comprising

file means for storing n-dimensional matrix type data on tha basis of one-dimensional address information, said one-dimensional address information having a value equal to

$$(a1-1)A2A3 \ldots An+(a2-1)A3A4 \ldots An+\ldots +(a(n-1)-1)An+an,$$

wherein a1, a2 . . . an is the n-dimensional coordinate and A1, A2 . . . An is the coordinate axis;

n-coordinate axes for respectively storing the maximum value of each coordinate axis of an n-dimensional coordinate;

scheme code storage means for storing a code designating any n-hierarchical scheme wherein each of n hierarchies is selected as desired from n coordinates, said n-hierarchical scheme being a single scheme having n hierarchies;

n address storage means, each corresponding to a hierarchy of a specific n-hierarchical scheme and each for storing an address indicating an ordinal number in a specific set in the corresponding hierarchy, n being an integer at least equal to 2;

selecting means connected to said address storage means for selecting a desired one of said address storage means and updating the contents thereof;

updating means connected to said selecting means for updating the contents of the selected address storage means; and

calculating means including a converter means including a converter means, said converter means connected to said n-coordinate axes, said scheme code storage means, said address storage means and said selecting means for calculating the one-dimensional address from the contents of said address storage means, the contents of said scheme code storage means and the contents of said n-coordinate axes, said file means being connected to said calculating means and being accessed by the one-dimensional address output from said calculating means, said converter means providing correspondence between the contents of said selected one of said address storage means and said n-dimensional coordinate in accordance with the contents of said scheme code storage means said converter means including a decoder, responsive to input scheme code signals, for providing different outputs of said converter means for the same inputs from said n-coordinate-axes, said converter means providing an output, and linear expander means for executing operation of said one-dimensional address information value in accordance with the output of said converter means and the contents of said n-coordinate axes, said linear expander means connected to said n-coordinate axes, said selecting means, and said converter means.

4,555,772

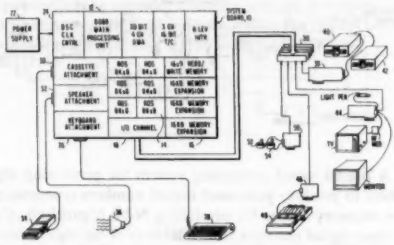
CURRENT CURSOR SYMBOL DEMARKATION

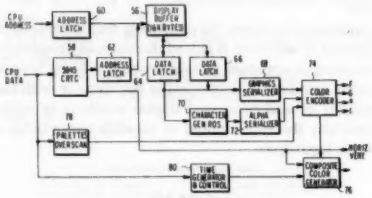
Lawrence K. Stephens, Charlottesville, Va., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 31, 1983, Ser. No. 499,452

Int. Cl.[4] G06F 9/00

U.S. Cl. 364—900 **2 Claims**





1. A computer system for providing an interactive graphics display comprising:

means for providing a table of selectable cursor graphic characters;

means for selecting one of said cursor graphic characters as the current cursor symbol;

means for displaying the selected cursor graphic character;

means for moving the displayed cursor graphic character on said means for displaying;

means for fixing an image of the currently displayed cursor graphic character on said means for displaying at one or more locations to generate a graphic display, said means for moving thereafter being capable of moving the currently displayed cursor graphic character to another location on said means for displaying; and

means for demarking the currently displayed cursor graphic character by an inverse video display of points of overlap of the cursor character and other graphic characters fixed on said means for displaying by exclusive ORing the data for the cursor character with the corresponding data of an overlapped character on said means for displaying.

4,555,773

PRINTING WITH A DATA STREAM INCLUDING MERGED GRAPHIC AND ALPHANUMERIC DATA

Roy E. Karnes, Jr.; Rex A. McCaskill, and Khoa D. Nguyen, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 11, 1983, Ser. No. 493,402

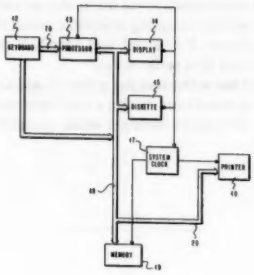
Int. Cl.[4] G06F 3/00

U.S. Cl. 364—900 **13 Claims**

1. In a word processing system having an interactive display

terminal for displaying by character generation a data stream representative of alphanumeric characters to be printed on a document and means for printing character by character on said document, the improvement comprising

means for integrating into said data stream, data representative of graphics,



means for converting said integrated graphics data into graphic characters whereby said graphics are also displayed through character generation, and

means for applying the data in said data stream to said printing means whereby said alphanumeric and graphic characters represented by said data stream are printed character by character to provide a document having integrated alphanumeric and graphic information.

4,555,774

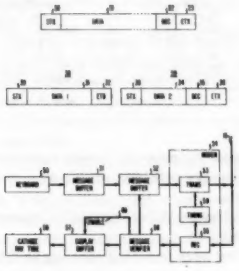
FAST RESPONSE FOR SWITCHED DATA NETWORKS

Lawrence Bernstein, Short Hills, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 19, 1982, Ser. No. 409,645

Int. Cl.⁴ G06F *3/00*

U.S. Cl. 364—900 **9 Claims**



1. An interactive mechanized request-response information handling system comprising

a data storage mechanism;

a data processor for reading, writing, and editing data in said storage mechanism;

a plurality of remote user terminals for providing information requests to said storage mechanism and for displaying responses to said requests as a plurality of successive display increments wherein each of said display increments includes only so much information as can be displayed at one time at any one of said terminals; and

a communications controller for formatting information responses from said data storage mechanism into two message blocks, one block of fixed length equal to the contents of a single one of said display increments to provide fast response to an inquiry, and the other block comprising the balance of the information response.

4,555,775

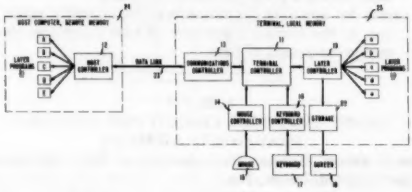
DYNAMIC GENERATION AND OVERLAYING OF GRAPHIC WINDOWS FOR MULTIPLE ACTIVE PROGRAM STORAGE AREAS

Robert C. Pike, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 7, 1982, Ser. No. 433,261

Int. Cl.⁴ G06F *3/00, 7/00;* **G06K** *15/18*

U.S. Cl. 364—900 **15 Claims**



1. A computer terminal display system comprising

a display surface,

means for simultaneously displaying a plurality of overlapping rectangular graphic layers on said surface, wherein each of said graphic layers comprises an autonomous level of graphical information,

means for associating each of said graphic layers with an independent computer program,

means for storing a complete bitmap for each of said graphic layers, and

means responsive to the associated one of said independent computer programs for continuously updating each of said bitmaps.

4,555,776

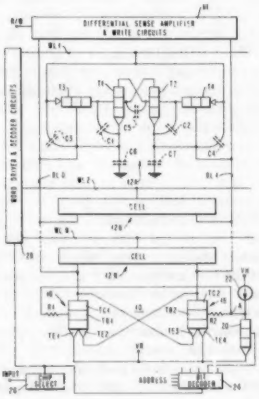
VOLTAGE BALANCING CIRCUIT FOR MEMORY SYSTEMS

Charles J. Masenas, Jr., Jericho, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,970

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—202 **23 Claims**



1. A voltage balance circuit comprising

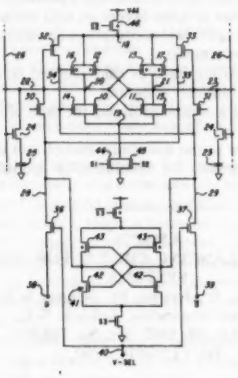
first and second conductive lines,
a point of reference potential,
first and second transistors, said first transistor being disposed between said first conductive line and said point of reference potential and said second transistor being disposed between said second conductive line and said point of reference potential,
means for coupling said first conductive line through said first transistor to said second conductive line,
means for coupling said second conductive line through said second transistor to said first conductive line,
means for applying simultaneously signals of unequal magnitude to a current carrying electrode of said first and second transistors through said first and second conductive lines during a given period of time, and
means for applying simultaneously substantially equal signals to the control electrodes of said transistors during said given period of time.

4,555,777

SENSE AMPLIFIER CIRCUIT FOR DYNAMIC READ/WRITE MEMORY

Ken A. Poteet, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 14, 1984, Ser. No. 640,715
Int. Cl.[4] G11C *7/00, 11/24*
U.S. Cl. 365—205 **14 Claims**



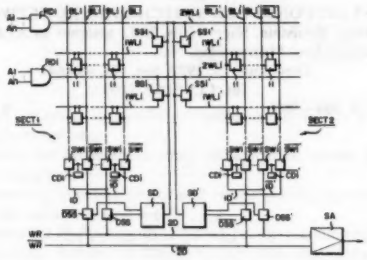
1. A semiconductor memory device comprising:
(a) an array of rows and columns of storage cells,
(b) addressing means for activating one of said rows of storage cells at a first time in an operating cycle,
(c) each column having a sense amplifier including first and second sense nodes connected to a pair of bit lines, the bit lines being coupled to storage cells of a column,
(d) each of said sense amplifiers comprising:
a CMOS cross-coupled flip-flop circuit having first and second N-channel transistors and first and second P-channel transistors, each of said transistors having a source-to-drain path and a gate, the source-to-drain paths of the first and second N-channel transistors being separately connected between said first and second sense nodes and grounding means, the source-to-drain paths of the first and second P-channel transistors being separately connected between said first and second sense nodes and voltage supply means,
third and fourth N-channel transistors and third and fourth P-channel transistors, each of said transistors having a source-to-drain path and a gate, the source-to-drain paths of said third and fourth N-channel transistors being separately connected across the source-to-drain paths of the first and second N-channel transistors, the source-to-drain paths of the third and fourth P-channel transistors being separately connected across the source-to-drain paths of the first and second P-channel transistors,
first and second coupling transistors, each having a source-to-drain path and a gate, the source-to-drain path of the first coupling transistor connecting said gates of the third N-channel and third P-channel transistors to said second sense node, the source-to-drain path of said second coupling transistor connecting said gates of the fourth N-channel and fourth P-channel transistors to said first sense node,
and means for activating the gates of said first and second coupling transistors during a read operation, and deactivating such gates during a write operation.

4,555,778

SEMICONDUCTOR MEMORY DEVICE

Takayasu Sakurai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jul. 31, 1984, Ser. No. 636,220
Claims priority, application Japan, Aug. 31, 1983, 58-159313
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **6 Claims**



1. A semiconductor memory device comprising:
a group of memory cells comprising of a plurality of memory sections;
a plurality of first word lines provided corresponding to said memory sections;
a plurality of bit lines provided crossing said first word lines;
a plurality of second word lines provided commonly for said memory sections and corresponding to said word lines;
a plurality of section switches respectively provided between said first and second word lines, said section switches selecting one of said memory sections according to the output of a section decoder;
first data lines provided corresponding to said bit lines;
a plurality of switches controlled by the output of a column decoder provided between said bit lines and said first data lines;
a pair of second data lines provided commonly for said memory sections and corresponding to said first data line; and
data line section switches provided between said first data lines and the pair of said second data lines in each of said memory sections, said data line section switches being controlled by the output of said section decoder.

4,555,779

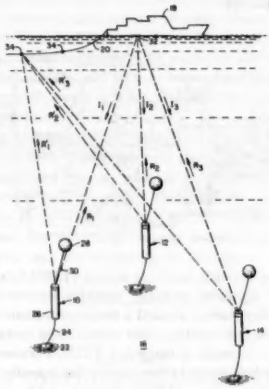
SUBMERGED MARINE STREAMER LOCATOR

F. Alex Roberts, Brea, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 215,195, Dec. 10, 1980, abandoned. This application Mar. 18, 1983, Ser. No. 476,690

Int. Cl.[4] G01S *15/06;* G01V *1/38*

U.S. Cl. 367—19 10 Claims



7. A method for determining the location of a submerged marine seismic streamer while being towed by an exploration vessel, which comprises:

positioning at least three transponders at known spaced apart locations on a sea floor;

towing a marine seismic streamer from an exploration vessel in the sea generally above said transponders;

generating an acoustic command signal from said vessel on a periodic basis;

receiving said acoustic command signal by each of said at least three transponders and in response to said acoustic command signal generating a distinctly different acoustic signal from each of said transponders;

detecting each of the transponder acoustic response signals at the vessel receiver;

detecting each of the transponder acoustic response signals at a plurality of receivers spaced apart along said streamer;

relaying a distinct signal along said streamer in response to each of said detected signals for recording thereof at said vessel and separately recording each of said transponder acoustic signals at said vessel;

measuring the time intervals from generation of said command signal to receipt of each of said transponder acoustic response signals by at least one receiver at said vessel;

determining the velocity of said at least one vessel receiver relative to each of said transponders by calculating the rate of change of range from a plurality of said time intervals corresponding to successive signals from each of said transponders being received by said vessel receiver;

calculating the initial time of generation of an acoustic response from said transponders; and

measuring the time intervals from generation of said transponder acoustic response signals to receipt of each of said response signals relayed from said spaced receivers along said streamer;

whereby the distance of each of said streamer receivers from each of said known positions of said transponders may be calculated.

4,555,780

OPTICAL RECORDING AND PLAYBACK UNIT

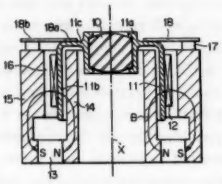
Hiroshi Koide, Kanagawa, Japan, assignor to Ricoh Co. Ltd., Japan

Filed Nov. 17, 1982, Ser. No. 442,244

Claims priority, application Japan, Nov. 19, 1981, 56-186053; Dec. 11, 1981, 56-199735

Int. Cl.[4] G11B *7/12*

U.S. Cl. 369—43 8 Claims



1. An optical recording and playback unit for use with a disc having information marked on its surface, the unit comprising: an optical lens, a bobbin for supporting at least the optical lens and having a portion on which, a composite coil assembly is disposed, including at least a first coil which is disposed at a first non-perpendicular angle with respect to the center axis of the bobbin and a second coil disposed at a second given angle with respect to the center axis, a magnetic circuit having a gap which defines a magnetic flux passing through the composite coil assembly in a direction substantially perpendicular to the center axis of the bobbin, and means for supporting the bobbin so as to be freely movable within the gap.

4,555,781

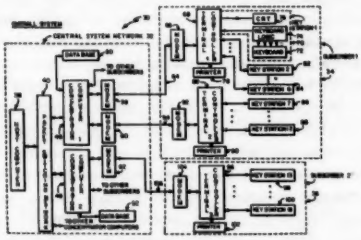
CONVERSATIONAL VIDEO SYSTEM HAVING LOCAL NETWORK CONTROL

Kenneth Baldry, Isleworth, and Martin Davids, Leigh-on-Sea, both of England, assignors to Reuters Ltd., London, England

Filed Mar. 30, 1983, Ser. No. 480,211

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 41 Claims



1. In a video communication network capable of providing textual data messages to a plurality of subscriber terminals throughout said network, at least a portion of said plurality of subscriber terminals comprising subscriber keystations, each of said subscriber keystations comprising a keyboard means for operator input of textual data messages and associated data control signals to said network via said keyboard means and a video display means for providing a textual video display of at least keyboard generated data input to said network; the improvement comprising at least one message switching interface means for routing video conversational textual data message calls throughout said network, said data messages being transmitted through said network in a plurality of data packets, a plurality of said keystations being operatively connected to

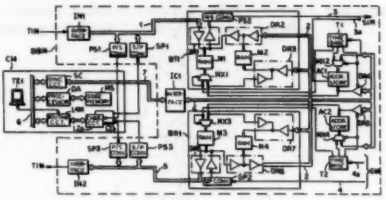
said one message switching interface means, said one message switching interface means comprising message routing logic means and storage means operatively connected to said message routing logic means for providing message routing logic control signals and further comprising display control logic means and local video display storage means for locally storing video conversational textual data for providing a video display thereof to at least a pair of said keystations which are operatively connected together through said one interface means in a completed call in said network, said keyboard means comprising means for providing unique calling signals to said interface means for initiating calls to a designated keystation portion of said plurality of keystations in said network, said one interface means further comprising means for receiving said calling signals provided thereto for completing a call to said designated connected keystation, said message routing logic means comprising means for controlling the routing of said calling signals and said data packets to said designated keystations to control the completion and conducting of said initiated calls, said display control logic means comprising means for providing on said pair of connected keystation video display means a video display of video conversational textual data transmitted in said data packets between said connected keystations in said network with which said call has been completed via said separate keyboard means associated with said pair of connected keystations, said keyboard means calling signal providing means further comprising means for providing said data packets to said interface means for providing said video conversational textual data messages between said connected keystations during a call therebetween, said one message switching interface means storage means comprising means for retrievably storing a packet routing control program for controlling the routing of said data packets between said connected keystations during said call therebetween, said switching interface means message routing logic means comprising means capable of accessing said packet routing control program in response to said calling signals and said data packet provision for connecting and routing said provided data packets between said connected keystations, said one message switching interface means comprising at least one node computer message routing means, at least one pair of switching concentrator computer message routing means operatively connected to said one node computer message routing means and to each other via a message communications link and at least one keystation terminal controller interface means operatively connected between each of said keystations between which said call is completed and each of said pair of switching concentrator computer message routing means, said node computer message routing means comprising said message routing logic means and said storage means operatively connected thereto, each of said switching concentrator computer message routing means comprising a local message routing logic means and a local storage means operatively connected thereto, each of said local storage means comprising means for locally retrievably storing a copy of said packet routing control program, each of said local message routing logic means comprising means capable of accessing said locally retrievably stored packet routing control program in response to said calling signals and said data packet provision between said keystations connected to said switching concentrator computer message routing means for enabling direct routing of calls between said keystations connected to said switching concentrator computer message routing means.

4,555,782

BASE-BAND EQUIPMENT FOR GROUND STATIONS OF SATELLITE TELECOMMUNICATION SYSTEM

Gian B. Alaria, Turin; Silvano Appiano, Montafia d'Asti; Paolo Destefanis, and Cesare Poggio, both of Turin, all of Italy, assignors to Cselt Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed Jan. 20, 1984, Ser. No. 572,578
Claims priority, application Italy, Jan. 21, 1983, 67069 A/83
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—104 **7 Claims**



1. In a time-division multiple access (TDMA) system for the exchange of digitized message samples between ground stations via a relay station aboard a communication satellite, each ground station transmitting data words from terrestrial sources in respective channels of outgoing TDMA frames via a radio-frequency up-link to said relay station for transfer to respective channels of incoming TDMA frames, each ground station receiving incoming TDMA frames via a radio-frequency down-link for distribution to terrestrial destinations,

the improvement wherein each ground station is provided with base-band equipment comprising a transmitting section, a receiving section and a control unit, interconnected via a bidirectional internal bus said transmitting section communicating with associated terrestrial sources via a first bus provided with a multiplicity of conductors carrying parallel bits of data words to be sent out, said receiving section communicating with associated terrestrial destinations via a second bus provided with a multiplicity of conductors carrying parallel bits of data words to be distributed;

said transmitting section including a first random-access frame memory having inputs connected to said first bus, a first random-access ancillary memory having inputs connected via said bidirectional internal bus to said control unit, first parallel/series conversion means connected to certain conductors of said first bus for extracting service information from the outgoing bit stream and feeding such information to said control unit, timing means connected to said frame memory establishing alternate first writing and reading phases for said first frame memory and supplying writing addresses thereto first storage means connected to said first timing means, said bidirectional internal bus said first frame memory and said first ancillary memory said first storage means being said readable by said first timing means for supplying reading addresses to said first frame memory during said first reading phases and to said first ancillary memory during certain of said first writing phases, said first ancillary memory being loadable by said control unit with extracted service information during said first reading phases through said internal bus, said first frame and ancillary memories having outputs connected by way of a parallel/series converter to a radio-frequency stage, and first series/parallel conversion means connected to certain conductors of said first bus for injecting service information from said control unit into the outgoing bit stream;

said receiving section including a second random-access frame memory having outputs connected to said second bus, a second random-access ancillary memory having outputs connected via said internal bus to said control

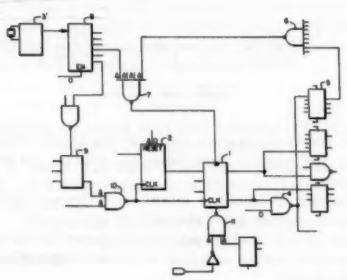
unit, second timing means connected to said second frame memory controlled by synchronizing signals in the incoming bit stream for establishing alternate second writing and reading phases for said second frame memory and supplying reading addresses thereto, said parallel/series conversion means connected to certain conductors of said second bus for extracting service information from the incoming bit stream and feeding such information to said control unit, second storage means, connected to said second timing means, said second frame memory and said second ancillary memory, said second storage means being readable by said second timing means for supplying writing addresses to said second frame memory during said second writing phases and to said second ancillary memory during certain of said second reading phases, said second ancillary memory being readable by said control unit through said internal bus during said second writing phases, said second frame and ancillary memories having inputs connected by way of a series/parallel converter to said radio-frequency stage, and second series/parallel conversion means connected to certain conductors of said second bus for injecting service information from said control unit into the incoming bit stream.

4,555,783

METHOD OF COMPUTERIZED IN-CIRCUIT TESTING OF ELECTRICAL COMPONENTS AND THE LIKE WITH AUTOMATIC SPURIOUS SIGNAL SUPPRESSION

Mark Swanson, Arlington, Mass., assignor to GenRad, Inc., Concord, Mass.

Filed Apr. 30, 1982, Ser. No. 373,809
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—15 **10 Claims**



1. A method of computerized in-circuit testing of components in circuit boards and the like, that comprises, forcing test signals under computer program control at selected nodes of the circuit that are inputs of the components thereof, effectively to isolate such components from the circuit and enable testing thereof as though such were not a part of the circuit; and suppressing possible spurious signals generated during such testing including the routing by the circuit of an output signal of a component under test via feedback paths to the input in interference with the forcing test signal and other spurious signal sources and paths shared by components, by:

(a) identifying circuit components feeding or processing input signals to the component(s) under test and that can pass said spurious signals; and

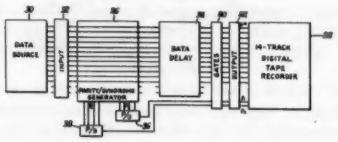
(b) automatically inhibiting potential transmission of spurious signals by applying specific signals to the identified components prior to or during the testing of the component(s) under test.

4,555,784

PARITY AND SYNDROME GENERATION FOR ERROR DETECTION AND CORRECTION IN DIGITAL COMMUNICATION SYSTEMS

Roger W. Wood, Manteca, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 5, 1984, Ser. No. 586,526
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—37 **3 Claims**



1. A parity and/or syndrome generator for generating a block parity check for the detection and/or correction of errors in a multi-channel digital data communication system using a linear code or a coset of such code in which data and parity bytes are intended to be digitally encoded in n by m bit data blocks to form a respective codeword in n parallel bytes of m bits in serial order of significance in the form of a codeword having n elements represented by respective said bytes in the Galois field $GF(2^m)$, such Galois field being defined by an m-order field generator polynomial in integral powers of z between z^0 and z^m, where z is the inverse of the delay operator z^{-1} of such Galois field, said parity generator and/or syndrome comprising:

first means responsive to byte-parallel data block bits of the same significance for producing a first partial parity check having m bits in each byte for the bit of said significance in each of the n elements of the respective codeword,

second means for summing in the Galois field over all elements of the codeword said first partial parity checks to form a second partial parity check having m bits in each byte,

a plurality of m-bit registers for registering bits,

third means for multiplying the bit content of each of said m-bit registers by the inverse of the delay operator in the Galois field and producing respective m-bit products and summing said m-bit products to said second partial parity checks to form a third parity check having m bits in each byte,

clock means for producing clock pulses, and

means responsive to said clock pulses for synchronously clocking said data block bits in the order of significance byte-parallel into said first means, clocking said third parity check into said m-bit registers, and clearing said m-bit registers after m bits.

4,555,785

OPTICAL REPEATER INTEGRATED LASERS

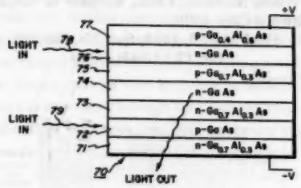
Donald R. Scifres, Los Altos; William Streifer, Palo Alto, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 336,750, Jan. 4, 1982, Pat. No. 4,450,567, which is a division of Ser. No. 56,765, Jul. 12, 1979, Pat. No. 4,316,156. This application Mar. 15, 1984, Ser. No. 589,796
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—8 **4 Claims**

1. An optical AND logic element comprising a plural layer semiconductor laser diode which is electrically biased to the point wherein light input causes the laser to commence lasing from an active semiconductor layer such that the improvement is characterized by:

a crystalline structure (60) of intermixed layers of n and p type semiconductor material, the junction of two of said intermixed layers being forward biased at the application of an electrical bias,

wherein when said electrical bias (V) is slightly less than the breakdown voltage of at least two back biased junctions in said crystalline structure and external light is supplied



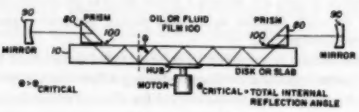
from at least two sources to said back biased junctions simultaneously, said back biased junctions becoming forward biased so as to stimulate the emission of laser light from said active semiconductor layer.

4,555,786

HIGH POWER SOLID STATE LASER

Robert L. Byer, Stanford, Calif., assignor to Board of Trustees of Leland Stanford, Jr. University, Stanford, Calif.

Filed Jun. 24, 1982, Ser. No. 391,529
Int. Cl.[4] H01S *3/091*
U.S. Cl. 372—70 **8 Claims**



1. In a solid state laser of the type characterized by a solid member of lasant meterial having a pair of opposed major faces between which optical lasant energy generated within said member is caused to be internally reflected in a zig-zag path, the improvement comprising:

optical pumping means for passing optical pumping radiation through a selected region of at least one of said major faces and into said member for optically pumping said lasant material; and

moving means for imparting cyclical relative motion between said member of lasant material and the selected region of said member which is illuminated by said optical pumping radiation so as to distribute the heat generated in said member of lasant material by said optical pumping radiation approximately evenly throughout the member of lasant material, whereby thermally induced depolarization and focusing effects are reduced in use.

4,555,787

GAS LASER PREIONIZATION DEVICE

David B. Cohn, Los Angeles, and Eugene E. Conley, Huntington Beach, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Division of Ser. No. 186,663, Sep. 12, 1980, Pat. No. 4,380,079. This application Mar. 21, 1983, Ser. No. 476,946
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—86 **2 Claims**

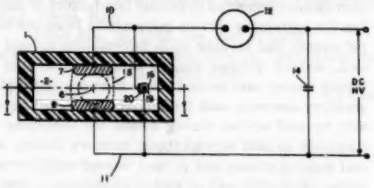
1. Apparatus for producing ultraviolet radiation for preionizing gas in a laser having a high voltage source, electrodes for generating a discharge when energized by said high voltage source, and a resonant cavity containing a gain medium excitable by said discharge from said high voltage source, the preionizing apparatus comprising:

a hollow dielectric tube positioned within said resonant cavity;

an inner wire conductor within said dielectric tube;

at least one outer conductor positioned along the outer surface of said dielectric tube; and

electrical connector means for applying a signal from said high voltage source across said dielectric tube between



said inner wire conductor and said outer conductor to generate ultraviolet radiation in the cavity to preionize the gain medium in the cavity

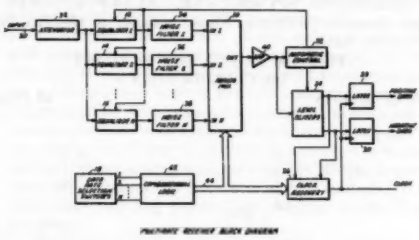
whereby said ultraviolet radiation is caused to create a stable uniform discharge of the gain medium.

4,555,788

MULTIPLE RATE BASEBAND RECEIVER

Dana A. Merrill, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.

Filed Feb. 23, 1984, Ser. No. 583,085
Int. Cl.[4] H04B *3/14*
U.S. Cl. 375—11 **10 Claims**



1. A baseband receiver for receiving bipolar data having positive and negative data pulses at a plurality of data rates, comprising:

a plurality of equalizer means 1—N for equalizing input bipolar data at a plurality of data rates 1—N;

means for selectively coupling said input bipolar data at a plurality of input data rates to a selected one of said equalizer means;

multiplexing means for selecting data from the selected equalizer means, and having an output;

automatic control means common to said equalizing means having the output of said multiplexing means coupled thereto, for providing a feedback adjustment for said equalizer means; and

level slicing means responsive to said selected equalizing means for receiving positive and negative data pulses from the received data in response to decision thresholds.

4,555,789

EQUALIZER CIRCUIT SUITABLE FOR ADAPTIVE USE WITH FIBER OPTICS

Charles R. Hogge, Jr., Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 26, 1983, Ser. No. 517,318
Int. Cl.[4] H03K *5/08*; **H04B** *3/14*
U.S. Cl. 375—11 **2 Claims**

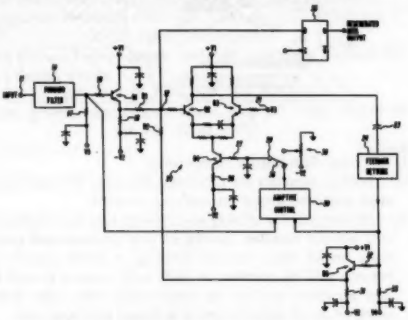
1. An equalizer circuit suitable for adaptive or manual con-

trol of the equalization of a circuit input signal having digital pulses exhibiting distortion, comprising:

means for providing a waveform which is the sum of signals at first and second summing inputs thereof;

means capable of responding to said circuit input signal to be equalized, for coupling it to the first of said summing inputs;

decision means for providing a first digital state output when said sum waveform assumes a value selected to correspond to a logic one and second digital state output when said sum waveform assumes a value selected to correspond to a logic zero, by responding to a comparison of



said sum waveform and a threshold, switching to provide said digital state outputs, at any time, based on said comparison, without the requirement of a clocking input;

gain control means, associated with said decision means, responsive to a control input level for controlling the magnitude of said digital state output so that said control input level can be adaptively or manually varied to achieve a change in equalization; and

means for processing said digital state outputs to provide an equalizing waveform to said second summing input for combination with the pulses of the circuit input signal to correct said distortion of the pulses.

4,555,790

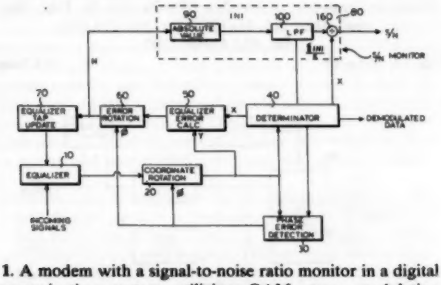
DIGITAL MODEM HAVING A MONITOR FOR SIGNAL-TO-NOISE RATIO

William L. Betts, 115 Bock Ciega Dr., Madeira Beach, Fla. 33541, and Kenneth Martinez, 6293 109th Ave. N., Pinellas Park, Fla. 33565

Filed Jun. 30, 1983, Ser. No. 509,716

Int. Cl.⁴ H03C *5/00*

U.S. Cl. 375—39 **4 Claims**



1. A modem with a signal-to-noise ratio monitor in a digital communication system utilizing QAM- type modulation adapted to receive signals which can be represented as a signal constellation, comprising:

means for determining ideal signals each one of said ideal signals corresponding to a received signal, and;

enabling means for enabling 2 monitoring means only when said received signals are the innermost signals with respect to the origin of said signal constellation;

said monitoring means comprising: means for generating a noise signal for said received signals, said noise signal being equal to the difference between said received signals and the corresponding ideal signals; and means for generating the rms value of said noise signals.

4,555,791

METHOD AND APPARATUS FOR DETERMINATION OF THE STATE OF AN ALL-OR-NONE MODULATED ALTERNATING SIGNAL IN A PERTURBED ENVIRONMENT

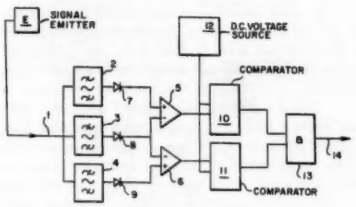
Jean-Francois Gabillet, Coye la Foret, France, assignor to Jeumont-Schneider Corporation, Puteaux, France

Filed May 13, 1982, Ser. No. 377,803

Claims priority, application France, May 19, 1981, 81 09919

Int. Cl.⁴ H04L *27/06*

U.S. Cl. 375—58 **4 Claims**



1. A method of determining, on reception, the state of a useful signal emitted at a predetermined frequency and initial amplitude and subjected to a perturbed environment, said signal being all-or-none modulated, comprising emitting into said environment simultaneously with the emission of said useful signal a non-modulated reference signal of the same initial amplitude at a neighboring frequency, receiving said useful and reference signals, continuously generating a difference signal of the amplitude proportional to the difference between the amplitudes of the received useful and reference signals, and comparing the amplitude of said difference signal to a reference value to indicate whether said useful signal is in an all state or in a none state.

4,555,792

TRANSMITTER FOR TRANSMITTING AN FSK-MODULATED SIGNAL

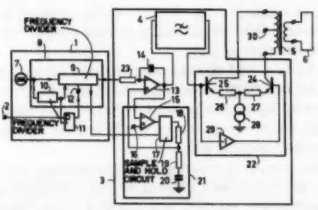
Nicolaas Van Tol, Huizen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,763

Claims priority, application Netherlands, Oct. 2, 1981, 8104487

Int. Cl.⁴ H04B *5/00;* **H04L** *27/12*

U.S. Cl. 375—62 **21 Claims**



1. A transmitter for transmitting an FSK-modulated signal

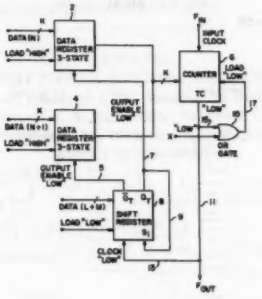
comprising: a frequency controllable signal generator, an inductive aerial, and a control arrangement responsive to an output signal of the signal generator and including a current source and means for controlling the current applied to the inductive aerial so that the amplitude of said aerial current is inversely proportional to the frequency of the signal to be transmitted.

4,555,793

AVERAGING NON-INTEGER FREQUENCY DIVISION APPARATUS

Daniel A. Benamy, Teaneck, N.J., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 28, 1983, Ser. No. 555,783
Int. Cl.[4] H03K *21/36*
U.S. Cl. 377—48 **6 Claims**



1. Frequency dividing apparatus, characterized by:

data register means loaded with digital inputs and providing corresponding outputs, said data register means including a first register having a plurality of parallel data input lines and responsive to a load input at a predetermined logic level for loading digital inputs corresponding to an integer N and a second data register having a plurality of parallel data input lines and responsive to the load input at the predetermined logic level for loading digital inputs corresponding to an integer (N+1);

counter means clocked by an input at a frequency to be divided, and responsive to the outputs from the data register means for providing an output at a frequency corresponding to the input frequency divided by the count of the counter means;

shift register means loaded with a perdetermined pattern of bits and clocked by the output of the counter means for providing outputs which enable the data register means, whereby for a predetermined number of clocks to the shift register means the digital inputs loaded into the data register means are loaded into the counter means a predetermined number of times, the shift register means being an (L+M) length shift register, with a pattern of (L+M) bits being loaded into the shift register in response to a load input at a predetermined logic level, and the shift register being clocked by the output of the counter means for providing a first output and a second output complementary to the first output,

one of the first and second data register outputs being enabled by one of the first and second shift register outputs, depending upon the present value of said shift register outputs, for applying one of the N and (N+1) integers to the counter means, and

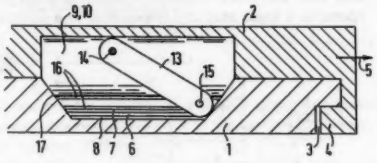
the counter means alternating its count between two integers in the predetermined pattern so that the average count approximates a rational non-integral value between the two integers.

4,555,794

X-RAY FILM HOLDER

Johann Finkenzeller, Erlangen, and Günter Hubert, Baiersdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,369
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3242639
Int. Cl.[4] G03B *11/00*
U.S. Cl. 378—187 **2 Claims**



1. An x-ray film holder comprising:

(a) a bottom member for receiving the x-ray film and associated, adjacent image intensifying screens;

(b) a lid member for closing said nolder, said lid member and said bottom member having mating grooves and projections on all sides thereof forming a guide system that permits said lid member to slide with respect to said bottom member, and to be interlocked with said bottom member on all sides when in a closed position; and

(c) means, disposed between said film and said intensifying screens on one hand and one of said bottom and said lid members on the other, for pressing said intensifying screens against said film, said pressing means, including:

(1) a foam cushion; and

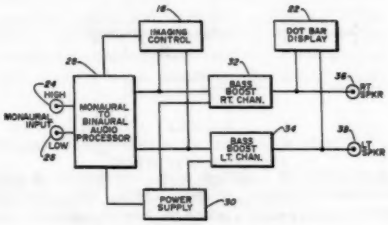
(2) an airtight cover surrounding said foam cushion having an external wall attached to one of said bottom and said lid members and extending over substantially the entire surface of said intensifying screens and said film, said cover and the wall of said one member to which said cover is attached having interconnecting openings to permit evacuation of the interior of said cover, and spring-biased lever means, swivally mounted on one of said members to which said cover is not attached and arranged to be operated by said pressing means, for preventing the opening of said lid member when said pressing means exerts a pressure on said intensifying screens and said film.

4,555,795

MONAURAL TO BINAURAL AUDIO PROCESSOR

John C. Bedini, Sylmar, Calif., assignor to TVI Systems, Ltd., Los Angeles, Calif.

Continuation-in-part of Ser. No. 400,631, Jul. 22, 1982. This application Jul. 21, 1983, Ser. No. 515,581
Int. Cl.[4] H04R *5/00*
U.S. Cl. 381—17 **39 Claims**



1. A monaural audio processing system comprising:

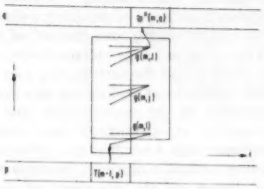
a monaural audio input;
a pair of audio outputs;
a low impedance drive means;
means coupling said monaural input to said low impedance drive means;
means being driven by said low impedance drive means, said means including phototransistor means for generating an unbalanced pair of outputs; and
output coupling means for coupling said unbalanced outputs to said audio outputs.

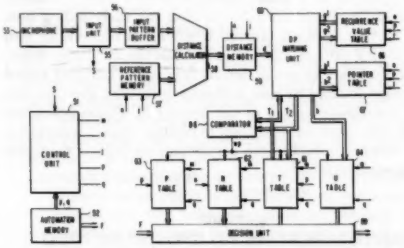
4,555,796

DP MATCHING SYSTEM FOR RECOGNIZING A STRING OF WORDS CONNECTED ACCORDING TO A REGULAR GRAMMAR

Hiroaki Sakoe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,088
Claims priority, application Japan, Dec. 10, 1981, 56-199098
Int. Cl.⁴ G10L *1/00*
U.S. Cl. 381—43 **1 Claim**





1. A system responsive to an input sequence of input pattern feature vectors representative of an input string of words selected from a word set of first through N-th words and substantially continuously uttered in compliance with a regular grammar for recognizing said input string as an optimum one of word concatenations, each concatenation being a string of words selected from said word set and cancatenated in compliance with said grammar, said grammar specifying a set of transition rules for said first through said N-th words and a set of final states of said concatenations, the transition rule for an n-th word optionally selected from said word set defining a combination of said n-th word and a state pair consisting of a start and an end state of said n-th word, said system comprising:

a reference pattern memory for memorizing reference pattern feature vectors representative of said first through said N-th words, the reference pattern feature vectors representative of said n-th word being consecutively numbered as first through J-th feature vectors according to utterance of said n-th word;

control means for generating a basic timing signal successively specifying first through I-th periods assigned to the respective input pattern feature vectors, a word specifying signal specifying, while an m-th period is specified as each of said first through said I-th periods, said first through said N-th words, and a state specifying signal specifying, while said m-th period is specified, the state pairs of said first through said N-th words;

similarity calculating means responsive to said input sequence and coupled to said reference pattern memory and said control means for calculating, while said n-th word is specified in said m-th period, a plurality of similarity measures between the input pattern feature vector assigned to said m-th period and said first through said J-th feature vectors;

extremum finding means coupled to said control means and said similarity calculating means for calculating, while said n-th word and each state pair of said n-th word are specified in said m-th period, a recurrence value $g_p^n(m, q)$ for said n-th word and said each state pair under a boundary condition iteratively in correspondence to said first through said J-th feature vectors by using the similarity measures calculated for said n-th word before said m-th period, where m represents said m-th period, n represents said n-th word, and p and q represents the start and the end states of said each state pair, for finding, while said m-th period is specified, an extremum T(m, q) of the recurrence values calculated for the words having state pairs including said end state q, and for deciding that particular word and that particular start state of said particular word for which said extremum is found, said boundary condition being given by T(m−1, p);

start period selecting means coupled to said control means and said extremum finding means for selecting, while said m-th period is specified, a particular period from said first through the (m−1)-th periods with reference to said particular start state and said particular word; and

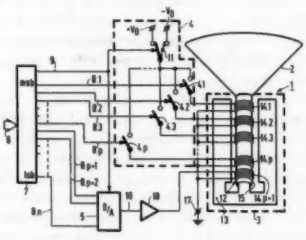
deciding means coupled to said control means, said extremum finding means, and said start period selecting means for deciding the optimum concatenation by referring, after lapse of said I-th period, to the extrema found in said first through said I-th periods, respectively, and to those particular words, those particular start states, and those particular start periods which are decided in said first through said I-th periods.

4,555,797

HYBRID LOUDSPEAKER SYSTEM FOR CONVERTING DIGITAL SIGNALS TO ACOUSTIC SIGNALS

Joris A. M. Nieuwendijk; Wilhelmus D. A. M. van Gijsel; Georgius B. J. Sanders, and Jacob M. van Nieuwland, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1984, Ser. No. 648,428
Claims priority, application Netherlands, Sep. 15, 1983, 8303185
Int. Cl.⁴ H04R *3/08, 9/06*
U.S. Cl. 381—117 **8 Claims**



1. A loudspeaker system for converting a digital electrical signal of N bits into an acoustic signal comprising:

an electromechanical transducer device for converting an

electrical signal into a mechanical quantity for driving a diaphram, said transducer including a plurality of p electrically driven sections, fewer in number than said number N bits of said digital signal, and a p+1 section for receiving an analog voltage;

means for driving each of said p electrical driven sections with one bit from the most significant bits of said electrical signal; and

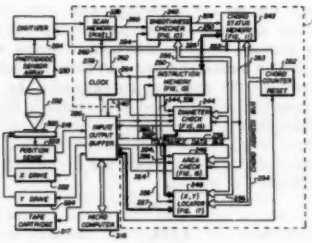
a digital to analog converter for receiving the least significant bits of said digital electric signal, said digital to analog converter connected to said p+1 section of said transducer whereby said transducer receives p digital signals and one analog signal for generating an acoustic signal.

4,555,798

AUTOMATIC SYSTEM AND METHOD FOR INSPECTING HOLE QUALITY

William H. Broadbent, Jr., Sunnyvale; Steve Buchholz, San Jose; Peter Eldredge, Santa Clara, and Mark J. Wihl, San Jose, all of Calif., assignors to KLA Instruments Corporation, Santa Clara, Calif.

Filed Jun. 20, 1983, Ser. No. 505,848
Int. Cl.[4] G06K *9/60*
U.S. Cl. 382—8 **28 Claims**



1. A method for inspecting the perimeter smoothness of a nominally round opening in an object comprising the steps of:

forming a two dimensional representation of the opening, said representation including two dimensional array of uniformly spaced pixels of a size substantially smaller than the size of said opening with each pixel having a range of digital values which indicate the presence, partial presence, or absence of said opening at the spatial position represented by that pixel, said array of pixels representing said opening as a connected group of pixels having first values at one end of said range surrounded by pixels having second values at the other end of the range, with the boundary therebetween representing the perimeter of said opening; and

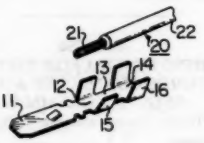
examining the values of the pixels in one or more clusters surrounding said opening, each said cluster being composed of a group of several adjacent pixels arranged in a pattern with its center at said boundary, and determining that said perimeter is smooth at the location of a particular cluster if the number of pixels within said cluster having said first value is close to the number of pixels within said cluster having said second value, and wherein said perimeter is not smooth at said location if the number of pixels within said cluster having said first value is greatly disproportionate to the number of pixels within said cluster having said second value.

4,555,799

METHOD FOR INSPECTING CRIMP BONDED TERMINALS

Hiroaki Kodama, Osaka; Tetsuo Kubo, Kyoto, and Sinkichi Miwa, Yokkaichi, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Oct. 24, 1983, Ser. No. 544,817
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 **8 Claims**



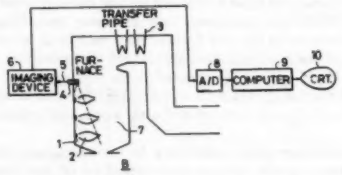
1. In a method for inspecting a sheathed wire crimp bonded terminal, comprising a sheathed wire having an end portion of a bared core of a sheathed wire obtained by removing a portion of said sheathing layer, said terminal crimping said core by a core crimping portion and said sheathing by a sheathing crimping portion, comprising the steps of obtaining a shadow image of a contour and a surrounding area thereof of said crimp bonded terminal by using an image pickup device, measuring the image of the contour and the surrounding area thereof of said crimp bonded terminal and performing processing operations on data obtained by the measurement, and making a decision on acceptance or rejection of said crimp bonded terminal in accordance with a result of the processing operations, said inspection method comprising the steps of selecting a predetermined corner on the periphery of the contour shadow image of said sheathing crimping portion of said crimp bonded terminal as a measurement reference point, scanning the shadow image of the contour and the surrounding area thereof of said crimped bonded terminal on the side of said core crimping portion thereof at preselected locations, determining coordinate values of density inversion boundary points in the image located by said scanning operation, and comparing the coordinate values of the density inversion boundary points in the image with respective predetermined acceptance values thereby to decide the acceptance or rejection of said crimp bonded terminal.

4,555,800

COMBUSTION STATE DIAGNOSTIC METHOD

Mitsuyo Nishikawa, Hitachi, and Nobuo Kurihara, Hitachiohta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 30, 1983, Ser. No. 527,847
Claims priority, application Japan, Sep. 3, 1982, 57-152623
Int. Cl.[4] G06K *9/00;* **G01J** *1/10*
U.S. Cl. 382—25 **7 Claims**



1. In an automatic method of diagnosing a combustion state in a furnace of a boiler or the like;

a combustion state diagnostic method comprising the steps of:

classifying shapes of flames into a plurality of patterns in advance, and storing them in advance as reference flames

in correspondence with combustion states at the respective flame patterns,

retrieving which of the stored flame shapes a detected flame shape of the furnace is similar to, and

diagnosing the combustion state of the furnace as the combustion state stored in correspondence with the flame shape which has been found the most similar to the detected flame shape by the retrieval.

4,555,801

PATTERN DISCRIMINATOR

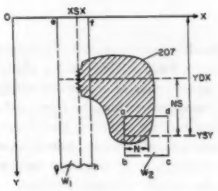
Michiaki Miyagawa, Hachiooji; Kouichi Ohki, Tokyo; Matsuhiko Takaya, Hino; Naoto Fujihara, Hino, and Tadayuki Yamada, Hino, all of Japan, assignors to Fuji Electric Co., Ltd., Japan

Division of Ser. No. 483,505, Apr. 11, 1983. This application Jan. 14, 1985, Ser. No. 691,164

Claims priority, application Japan, Apr. 30, 1982, 57-71498; Apr. 30, 1982, 57-71499; Apr. 30, 1982, 57-71500

Int. Cl.⁴ G06K *9/36*

U.S. Cl. 382—44 **5 Claims**



1. In a pattern discriminator which receives scanning data obtained by scanning an object within a defined window region with a photoelectric converter of the two-dimensional scanning type, and having means for converting the scanned data into pixel binary data representing characteristics of the object scanned by using a threshold value, and having means for evaluating the binary data in accordance with predetermined criteria and for producing an output signal indicative of said evaluation, the improvement comprising means for detecting a positional shift of an object being scanned relative to the position of a reference object comprising:

means for detecting the scanning position of reference coordinates for an object being scanned, comprising means for obtaining a first value related to the position of the first scanning line where the length of the scan of said object along a plurality of a first group of adjacent scanning lines within a first reference window exceeds a first threshold level, and for obtaining a second value related to the average length of the scan of said object along a plurality of a second group of adjacent scanning lines within a second reference window; and

means for obtaining the difference between the reference position of said object as indicated by said first and second values and a corresponding reference position of a reference object, whereby the difference obtained is used to shift the defined window regions used for obtaining scanning data.

4,555,802

COMPACTION AND DECOMPACTION OF NON-CODED INFORMATION BEARING SIGNALS

John F. Fedak; Gerald I. Findley, and Terry A. Torr, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,920

Int. Cl.⁴ G06K *9/00*; H04N *7/12*

U.S. Cl. 382—56 **13 Claims**

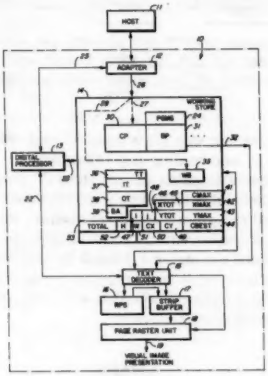
1. The machine-implemented method of processing image-representing signals consisting of an array of binary digital signals wherein a first binary digital signal represents a background image pel and a second binary digital signal represents a foreground image pel;

including the automatic steps of:

dividing said array of binary signals into segments wherein each segment is a subarray of said binary signals having a size relatable to predetermined image-presenting characteristics of a machine which is to present the represented image;

examining all segments in the array for identifying those segments having one or more of said second binary signals;

grouping the identified segments into rectangular groups of segments and assigning a name to each group along with



an identification of the logical position of the group of segments within said array;

storing said groups of segments as addressable units in a data storage device;

receiving a command to present the image represented by said array of digital signals; and

visually presenting said image in accordance with said received command by accessing said stored segments from said data-storage device and visually presenting same as said image in a relative or logical position indicated by said identification of logical position with respect to an array of background pels generated independently of said stored segments as an array of pels having an array size in accordance with said array of binary digital signals.

4,555,803

IMAGE INFORMATION FILING APPARATUS AND METHOD

Kenji Hirose, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 30, 1983, Ser. No. 480,272

Claims priority, application Japan, Apr. 2, 1982, 54-55142

Int. Cl.⁴ G06K *9/00*; G11B *7/00*

U.S. Cl. 382—61 **8 Claims**

1. A method comprising the steps of:

(1) determining whether a finish data storing area defined by a first storing medium contains finish data;

(2) reading a recognition code from a first recognition code storing area defined by said first storing medium;

(3) if said determining step (1) determines that said finish data storing area contains no finish data, performing the steps of:

(a) writing the recognition code read by said reading step (2) into a second recognition code storing area defined

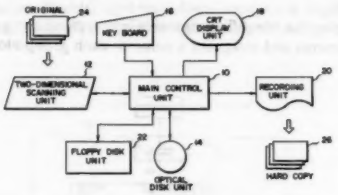
by a second storing medium different from said first storing medium, and

(b) writing finish data into said finish data storing area;

(4) if said determining step (1) determines that said finish data storing area does contain finish data, performing the steps of:

(a) reading a recognition code from said second recognition code storing area, and

(b) determining whether said recognition code read by



said reading step (2) is equal to said recognition code read by said reading step (4)(a); and

(5) subsequent to either of said steps (3) and (4), and provided that said determining step (4)(b) does not determine said read recognition codes are unequal, reading information from and/or writing image information into an image information storing area defined by said first storing medium at least partially in response to retrieval information stored in a retrieval information storing area defined by said second storing medium.

4,555,804

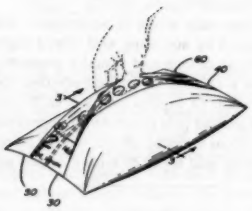
POUCH HANDLE

Howard Canning, Brantford, and Peter Weber, Burlington, both of Canada, assignors to Twinpak, Inc., Dorval, Canada

Filed Jul. 12, 1984, Ser. No. 630,236

Int. Cl.[4] B65D *33/10*

U.S. Cl. 383—25 **2 Claims**



1. A flexible, relatively-limp package, comprising in combination, an elongated, flexible, limp container filled with a fluent material and sealed at opposite, transverse ends; and a relatively flat, flexible strip-handle element extending from end-to-end of said container, intermediately of opposite side edges of said container and lying in juxtaposed relation on the outer surface of the package when the package is at rest, means securing the strip-handle element at opposite ends to the opposite sealed ends of the container and longitudinally along the entire length of said strip handle element to said container and defining on opposite sides of the longitudinal seal, free, finger-grippable portions, the filled, limp package being flexed upwardly from its ends when lifted, said free, finger-grippable portions being juxtaposed, when the package is lifted, said finger-grippable portions having a compound curve configuration from the sealed ends of the package when it is lifted at said finger-grippable portions off a support surface whereby the load of the package is substantially distributed along all said seals when lifted.

4,555,805

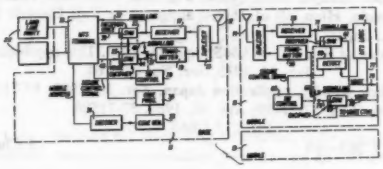
SECURE MOBILE TELEPHONE SYSTEM

Robert D. Talbot, Pittsford, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 130,345, Mar. 14, 1980, Pat. No. 4,411,017. This application Apr. 27, 1983, Ser. No. 489,025

Int. Cl.[4] H04L *9/00*

U.S. Cl. 455—26 **28 Claims**



26. In a radio frequency mobile telephone communication system including a base station and a plurality of mobile stations in which unenciphered communication between a mobile station and the base station may be received and understood by each of the other mobile stations, the improvement wherein:

(a) each of said plurality of mobile stations includes:

(i) means of sending to the base station an unenciphered request for secure communication,

(ii) means responsive to receipt of an encoded communication from the base station to encode subsequent transmissions to the base station in a code unique to the mobile station, and

(iii) means responsive to receipt of an encoded communication for decoding subsequently received transmission from the base station encoded in said unique code; and

(b) wherein said base station includes:

(i) means for receiving an unenciphered request for secure communications from a mobile station,

(ii) means for identifying from the request the particular mobile station and for determining the code unique thereto,

(iii) means for transmitting an encoded communication signal to the mobile station in said unique code,

(iv) means for decoding subsequently received transmissions from the mobile station in said unique code, and

(v) means for encoding subsequent transmissions to said mobile station in said unique code;

whereby the base station and one of the plurality of mobile stations may communicate using a code unique to that mobile station in response to an unenciphered request by the mobile station for secure communications.

4,555,806

SYSTEM FOR THE AUTOMATIC ESTABLISHMENT OF A SHORTWAVE TELEGRAPHY SIGNAL CONNECTION

Wolf-Ruediger Lange, Dachau; Anton Wessel; Udo Böhler, both of Munich; Klaus Volkheimer, Grafing; Günter Greiner, and Peter Islet, both of Munich, all of Fed. Rep. of Germany, assignors to Rohde & Schwarz GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,771

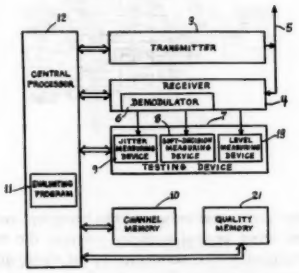
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211325

Int. Cl.[4] H04B *17/00*

U.S. Cl. 455—62 **34 Claims**

15. A method for automatically establishing at a calling station a shortwave telegraphy connection between the calling station and a receiving station on one of a plurality of channels comprising:

(a) searching through the channels with a receiver;
(b) performing a passive channel analysis on each channel, said analysis consisting at least of measuring the strength and jitter of the digital signals received by the receiver on each channel to produce objective measurement values for each channel;
(c) storing the objective measurement values in a memory;
(d) tuning a transmitter to the channel having the best objective measurement value;
(e) sending a call signal through the transmitter over the channel to which it is tuned;
(f) waiting a predetermined amount of time for an acknowledgment signal from the receiving station on the channel used for sending the cell signal and if no signal is received, tuning the transmitter to a next selected one of said channels and performing steps (e) and (f) until an acknowledgment signal is received;
(g) commencing message transmitting-and-receiving after receiving an acknowledgment signal over the channel used by the call signal and the acknowledgment signal;
(h) performing an active channel analysis on the channel on which message transmitting-and-receiving has been established, said active channel analysis consisting of at least measuring the strength and jitter of the digital signals on said channel to determine additional objective measurement values of the transmission quality of said channel; and
(i) replacing the objective measurement values obtained by passive channel analysis and stored in said memory with the additional objective measurement values obtained by active channel analysis.

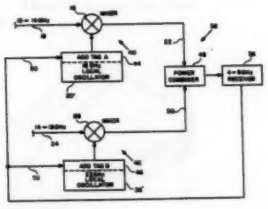


STATION 1 AND STATION 2

4,555,807
APPARATUS AND METHOD FOR CHANNEL IDENTIFICATION

William E. Bryant, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 8, 1983, Ser. No. 520,927
Int. Cl.⁴ H04B *1/26, 17/00*
U.S. Cl. 455—137 **20 Claims**

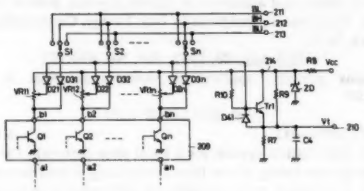


1. The improvement to a baseband system having a plurality of down converters, each capable of producing a converter output signal, each having a mixer and local oscillator with all the converters feeding a single baseband receiver, comprising:
(a) a plurality of tag producing means operably connected to respective ones of the down converters for selectively adding a tag, identifying the converter producing an output signal, to the output signal from that converter; and
(b) tag initiation means operably connected to said tag producing means for initiating the adding of said tags to the output signals from the converters at a time preset for each tag in response to at least one converter output signal.

4,555,808
TUNER APPARATUS

Isao Fujimoto, Katano, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 185,138, Sep. 8, 1980, abandoned. This application Dec. 2, 1982, Ser. No. 446,356
Claims priority, application Japan, Sep. 14, 1979, 55-118597; Jan. 19, 1980, 56-4961
Int. Cl.⁴ H03J *3/24;* H04B *1/06*
U.S. Cl. 455—180 **11 Claims**



2. A tuner apparatus comprising:
a tuning circuit having a plurality of receiving bands, said tuning circuit including a voltage controlled variable reactance means used for said plurality of receiving bands;
single tuning voltage generating means coupled to said tuning circuit for generating a tuning voltage and applying said tuning voltage to said voltage controlled variable reactance means, said generating means being provided for all of said plurality of receiving bands;
maximum receivable frequency defining means, including a trimmer loop and resonance conductors provided in said tuning circuit for determining the maximum receivable frequency of the highest of said plurality of receiving bands of said tuning circuit with respect to the highest tuning voltage within a predetermined range; and
single upper limit restricting means coupled to said tuning voltage generating means for restricting the upper limit of said tuning voltage applied to said voltage controlled variable reactance means to, or slightly higher than, said highest tuning voltage.

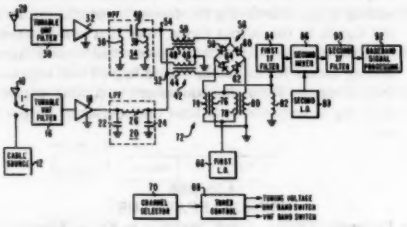
4,555,809
R.F. DIPLEXING AND MULTIPLEXING MEANS

David J. Carlson, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 26, 1983, Ser. No. 545,670
Int. Cl.⁴ H04B *1/26;* H03H *7/42, 7/46*
U.S. Cl. 455—190 **26 Claims**

20. Apparatus comprising:
VHF and UHF signal sources;
a first balun having unbalanced and balanced ports, said unbalanced port having a pair of terminals respectively coupled to said sources;
means for selectively grounding a selected one of said terminals;
a mixer coupled to said balanced port;

a second balun having an unbalanced port and a balanced port coupled to said mixer; and



a local oscillator coupled to said second balun unbalanced port.

4,555,810

DISTRIBUTION SYSTEM FOR A LOCAL AREA NETWORK

Giok D. Khoe, and Johannes H. C. van Heuven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

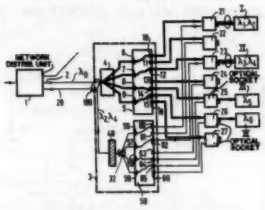
Filed Aug. 23, 1982, Ser. No. 410,752

Claims priority, application Netherlands, Sep. 4, 1981, 8104104

Int. Cl.[4] H04B 9/00

U.S. Cl. 455—612 **6 Claims**

1. A distribution system for a local area network, the distribution system being of the type comprising a distribution unit which is coupled to a plurality of subscriber's premises via optical transmission links, the premises of each subscriber being provided with a common terminal unit having at least one input and a plurality of outputs, the input to the common terminal unit being coupled to an optical transmission link and the outputs being connected to a plurality of sockets via further transmission links, wherein the improvement comprises the input of the common terminal unit is connected to the outputs of the common terminal unit via the series arrangement of a power splitter and a first distribution box the number of inputs of the distribution box being less than the number of outputs thereof and the distribution box comprising means for selectively through-connecting its inputs to an equal number of



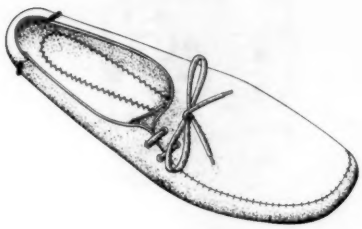
outputs, the further transmission links being optical cables and the sockets being optical sockets, wherein the input of the common terminal unit is connected to the distribution unit via first and second optical fibers, the first optical fiber being connected via a power splitter to the first distribution box whose outputs are connected to the respective sockets via a first set of optical fibers, the second optical fiber being connected via an optical filter and a second power splitter to a second distribution box, whose outputs are connected to the respective sockets via a second set of optical fibers.

281,455
HAT
Craig P. Woods, 548 Simoron, Ogden, Utah 84404
Filed May 31, 1983, Ser. No. 441,868
Term of patent 14 years
U.S. Cl. D2—243

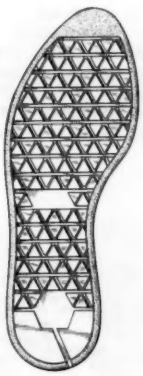
281,456
BEADED HEADBAND
Lois D. Swedarsky, and Leonard I. Swedarsky, both of 712 E. Haney, South Bend, Ind. 46613
Filed Mar. 17, 1983, Ser. No. 476,335
Term of patent 14 years
U.S. Cl. D2—253

281,457
SHOE
Chan K. Po, Room 1105, 11th Floor, East Town Building, 41 Lockhart Rd., Wanchai, Hong Kong
Filed Feb. 4, 1983, Ser. No. 463,664
Claims priority, application United Kingdom, Aug. 6, 1982, 1008189
Term of patent 14 years
U.S. Cl. D2—310

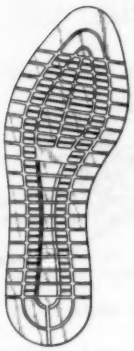
281,458
SHOE
Patrick J. Roberts, Castlebamford, and Kevin P. Hogan, Tevere, both of Ireland, assignors to Padmore & Barnes International Limited, Kilkenny, Ireland
Filed Jan. 28, 1983, Ser. No. 461,929
Claims priority, application Ireland, Jul. 28, 1982, 183/82
Term of patent 14 years
U.S. Cl. D2—313



281,459
SHOE OUTSOLE
Mark G. Parker, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 21, 1983, Ser. No. 506,412
Term of patent 14 years
U.S. Cl. D2—320



281,460
SHOE OUTSOLE
Mark G. Parker, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 21, 1983, Ser. No. 506,413
Term of patent 14 years
U.S. Cl. D2—320



281,461
SHOE SOLE
Charles Bergmans, Sprang Capelle, Netherlands, assignor to Clarks of England, Inc., Kennett Square, Pa.
Filed Mar. 11, 1983, Ser. No. 474,492
Term of patent 14 years
U.S. Cl. D2—320

281,462
SHOE SOLE
Nicholas J. Pope, London, England, assignor to Dunlop Limited, London, England
Filed May 12, 1983, Ser. No. 494,027
Claims priority, application United Kingdom, Nov. 12, 1982, 1009683
Term of patent 14 years
U.S. Cl. D2—320

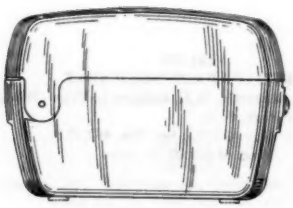
281,463
CARRYING CASE FOR A CAMERA AND ACCESSORIES
Theodore E. Rodrigues, 15 Cottonwood Dr., San Rafael, Calif. 94901
Filed Oct. 17, 1983, Ser. No. 542,380
Term of patent 14 years
U.S. Cl. D3—33

281,464

STORAGE TRAY FOR DISKETTES OR THE LIKE

Craig D. Drake, Muscatine, Iowa, assignor to Ring King Visibles, Inc., Muscatine, Iowa

Filed Apr. 14, 1983, Ser. No. 485,018
Term of patent 14 years
U.S. Cl. D3—35



281,465

SOFT-SIDED GARMENT BAG

Harvey Bomes, Wellesley Hill; John Pulichino, Wellesley; Jack Barber, Cambridge, and Max Bell, Milford, all of Mass., assignors to American Tourister, Inc., Warren, R.I.

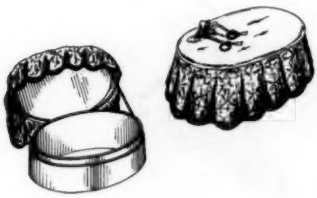
Filed Aug. 31, 1983, Ser. No. 527,992
Term of patent 14 years
U.S. Cl. D3—71

281,466

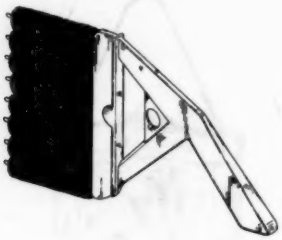
RING CUSHION MEMENTO CHEST

Richard Minsky, 109-03 86th Ave., Richmond Hill, N.Y. 11418

Filed Jun. 24, 1983, Ser. No. 507,574
Term of patent 14 years
U.S. Cl. D3—78



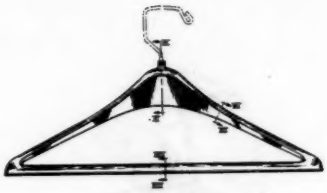
281,467
BRUSH FOR CLEANING VENETIAN BLIND
Lee Chan-Foun, No. 18-1, Lane 76, Nan Chang St., Feng Shan, Kaohsiung Hsien, Taiwan
Filed Jan. 11, 1983, Ser. No. 457,158
Term of patent 14 years
U.S. Cl. D4—119



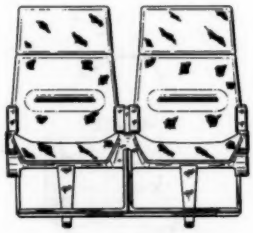
281,468
HOSIERY HANGER
Paul B. Keenan, Millburn, and Barry T. Fisher, Long Valley, both of N.J., assignors to Chipman-Union, Inc., Union Point, Ga.
Filed Aug. 30, 1983, Ser. No. 513,753
Term of patent 14 years
U.S. Cl. D6—317

281,469
STOCKING HOLDER
John R. Honermann, P.O. Box 20502, Bloomington, Minn. 55420
Filed Mar. 17, 1983, Ser. No. 476,036
Term of patent 14 years
U.S. Cl. D6—317

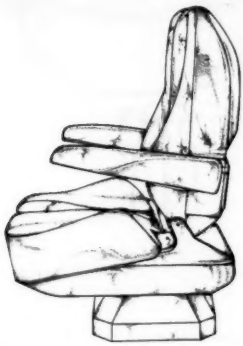
281,470
GARMENT HANGER
John H. Batts, East Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.
Filed Nov. 14, 1983, Ser. No. 551,428
Term of patent 14 years
U.S. Cl. D6—319



281,471
AIRCRAFT PASSENGER SEAT
Daniel S. Sauter, Montvale, N.J., assignor to Trans World Airlines, Inc., New York, N.Y.
Filed May 6, 1983, Ser. No. 492,371
Term of patent 14 years
U.S. Cl. D6—356



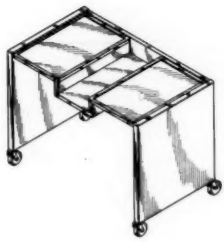
281,472
AIRCRAFT SEAT OR SIMILAR ARTICLE
Richard Soederberg, Mühlacker, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 24, 1983, Ser. No. 478,374
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 5533
Term of patent 14 years
U.S. Cl. D6—356



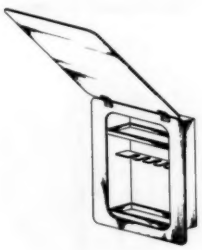
281,473
CHAIR
Mark Singer, 1663 Cambridge St., Cambridge, Mass. 02138
Filed Jul. 19, 1982, Ser. No. 399,377
Term of patent 14 years
U.S. Cl. D6—379

281,474
COMBINED BED AND DESK-TABLE
Pierre A. R. J. M. G. Moorkens, 12, Avenue des Eoliennes Boîte 10, Woluwe St Lambert, Belgium
Filed Jul. 5, 1983, Ser. No. 510,944
Term of pateat 14 years
U.S. Cl. D6—384

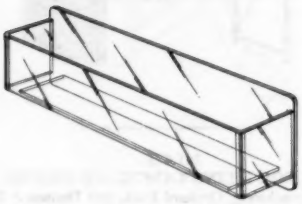
281,475
DESK FOR FILING CANCELLED CHECKS
Peter M. Braunschweig, Orchard Park, and Thomas J. Ruffles, Jr., Tonowanda, both of N.Y., assignors to Astronics Corporation, Orchard Park, N.Y.
Filed Aug. 4, 1983, Ser. No. 520,437
Term of patent 14 years
U.S. Cl. D6—426



281,476
CABINET FOR TOOTHBRUSHES, TOOTHPASTE OR THE LIKE
Willard G. Smith, Jr., 71 Cemetery Rd., R.F.D. #1, Harwich, Mass. 02645
Filed Feb. 14, 1983, Ser. No. 454,965
Term of patent 14 years
U.S. Cl. D6—559



281,477
RACK
Paul J. Neff, 1143 Mississauga Rd., Mississauga, Ontario, Canada (L5H 2J1)
Filed Jan. 5, 1983, Ser. No. 455,637
Claims priority, application Canada, Nov. 26, 1982, 26-11-2-8
Term of patent 14 years
U.S. Cl. D6—574



281,478
INSULATING VESSEL
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Oct. 12, 1982, Ser. No. 433,634
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, MR 174; Finland, Sep. 16, 1982, 824/82
Term of patent 14 years
U.S. Cl. D7—77

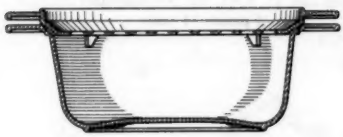
281,479
INSULATED JUG
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Oct. 12, 1982, Ser. No. 433,647
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, MR 172
Term of patent 14 years
U.S. Cl. D7—317

281,480

COMBINED CASSEROLE DISH AND ROASTING RACK

Donald R. McClelland, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jul. 6, 1982, Ser. No. 395,655
Term of patent 14 years
U.S. Cl. D7—356

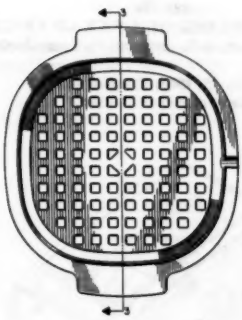


281,481

GRILL

Michel B. Geiser, Paris, France, assignor to Haute Fourneau et Fonderies de Cousances, Ancerville, France

Filed Feb. 23, 1983, Ser. No. 468,953
Claims priority, application France, Aug. 31, 1982, 822951
Term of patent 14 years
U.S. Cl. D7—361



281,482

WINDING REEL

Yoshiaki Suzuki, Yokohama, Japan, assignor to Toko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,143
Claims priority, application Japan, May 11, 1983, 58-19384
Term of patent 14 years
U.S. Cl. D8—358

281,483

NAP-HOOK FOR SAIL-SURFING BOARDS

Christian Faidide, Maringues, France, assignor to S.A.R.L. Wichard, Thiers, France

Filed Jul. 20, 1983, Ser. No. 515,483

Claims priority, application France, Jan. 21, 1983, 830197

Term of patent 14 years

U.S. Cl. D8—367

281,484

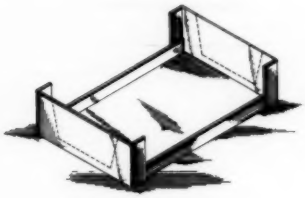
DESIGN FOR A PACKING TRAY

Theodore W. Dickes, Old Saybrook, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Oct. 12, 1982, Ser. No. 433,674

Term of patent 14 years

U.S. Cl. D9—432



281,485

VEHICLE TIRE

Kenichi Motomura, and Mamoru Mamada, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 455,437

Claims priority, application Japan, Jul. 29, 1982, 57-34005

Term of patent 14 years

U.S. Cl. D12—142

281,486

FUEL TANK FOR MOTORCYCLE

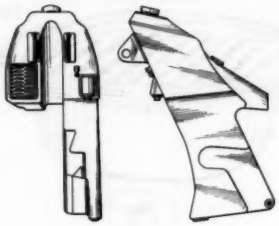
Shigeru Hattori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Jul. 8, 1982, Ser. No. 396,403

Claims priority, application Japan, Jan. 12, 1982, 57-666

Term of patent 14 years

U.S. Cl. D12—155



281,487

PICK-UP TRUCK TONNEAU COVER

Scott T. Chapman, Elkhart, Ind., assignor to Bivouac Industries, Inc., Vandalia, Mich.

Filed Jan. 21, 1983, Ser. No. 460,016

Term of patent 14 years

U.S. Cl. D12—156

281,488

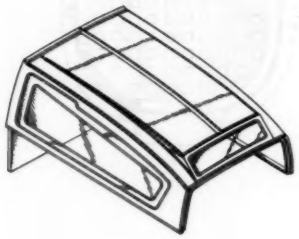
CAP FOR THE BED OF A PICK-UP TRUCK

John Collins, Elkhart, Ind., assignor to Leer, Incorporated, Elkhart, Ind.

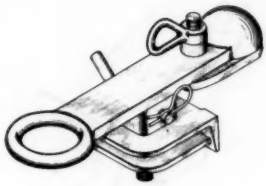
Filed Feb. 18, 1983, Ser. No. 467,779

Term of patent 14 years

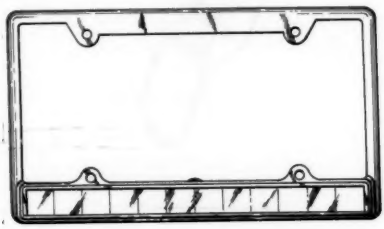
U.S. Cl. D12—156



281,489
CONVERTIBLE COUPLER
Roy T. Hancock, Rte. 1, Box 1757 F, West Sacramento, Calif. 95691
Filed Mar. 22, 1983, Ser. No. 477,781
Term of patent 14 years
U.S. Cl. D12—162



281,490
LICENSE PLATE HOLDER AND DISPLAY DEVICE
Paul Lien, 712 N. Jackson, Glendale, Calif. 91206
Filed Nov. 14, 1983, Ser. No. 550,793
Term of patent 14 years
U.S. Cl. D12—193

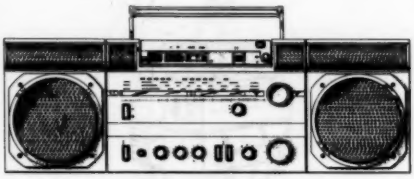


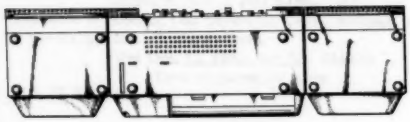
281,491
WHEEL COVER
John R. Schinella, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 22, 1983, Ser. No. 525,018
Term of patent 14 years
U.S. Cl. D12—211

281,492
ENGINE GENERATOR
Tadahiro Yaguchi, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 29, 1983, Ser. No. 527,276
Term of patent 14 years
U.S. Cl. D13—2

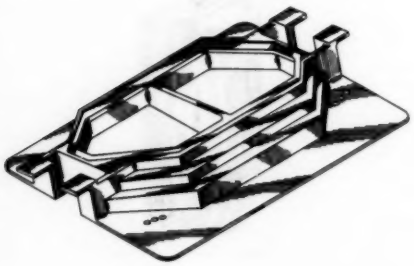
281,493
INPUT/OUTPUT MODULE FOR PROGRAMMABLE CONTROLLER
Jay M. Prager, Nashua, N.H.; Roman Y. Gonzales, Andover, and Charles M. Ault, Winchester, both of Mass., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Sep. 23, 1982, Ser. No. 422,470
Term of patent 14 years
U.S. Cl. D13—40

281,494
PORTABLE COMBINED CASSETTE PLAYER, TUNER, AMPLIFIER AND SPEAKERS
Vinod S. Sujanani, Aberdeen, Hong Kong, assignor to The Electronic Sports Collection (Far East) Limited, Central, Hong Kong
Filed Sep. 1, 1982, Ser. No. 413,966
Term of patent 14 years
U.S. Cl. D14—5

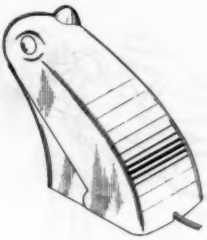




281,495
ADAPTER FOR MOUNTING LOUDSPEAKERS
Pasco C. Ponticelli, 7455 Owensmouth Ave., Canoga Park, Calif. 91303
Filed Aug. 8, 1983, Ser. No. 521,087
Term of patent 14 years
U.S. Cl. D14—37



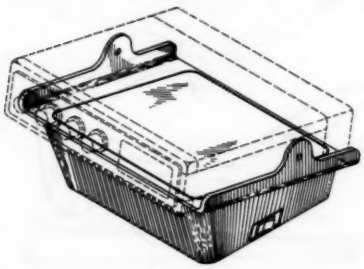
281,496
HOUSING FOR A TELEPHONE SET
Tung S. Chen, 2-6th Fl. 13, Lane 118, Chung Ching S. Rd. Sec. 1, Taipei, Taiwan
Filed May 13, 1983, Ser. No. 494,514
Term of patent 14 years
U.S. Cl. D14—53



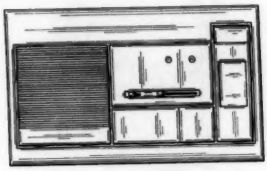
281,497
ILLUMINATED TELEPHONE HANDSET SUPPORT ATTACHMENT
Alexander Behring, 828 Ninth St., Santa Monica, Calif. 90403
Filed Apr. 28, 1983, Ser. No. 489,680
Term of patent 14 years
U.S. Cl. D14—59

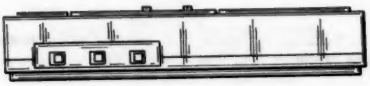
281,498
PUSH BUTTON
Hiroshi Inaba, Yokohama, Japan, assignor to Nippon Tsushin Kogyo Kabushiki Kaisha, Kanagawa, Japan
Filed Apr. 29, 1983, Ser. No. 490,216
Claims priority, application Japan, Dec. 24, 1982, 57-57465
Term of patent 14 years
U.S. Cl. D14—59

281,499
RADIO BASE MOUNTING UNIT OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 19, 1983, Ser. No. 533,091
Term of patent 14 years
U.S. Cl. D14—76

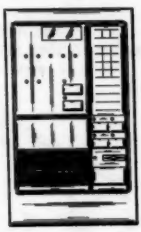


281,500
INTERPHONE
Hiroshi Yamagata, and Kendo Makihara, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 19, 1983, Ser. No. 496,118
Claims priority, application Japan, Nov. 30, 1982, 57-54177
Term of patent 14 years
U.S. Cl. D14—92

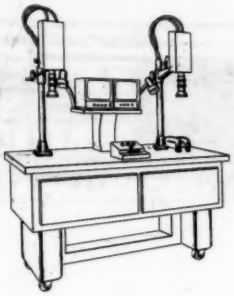




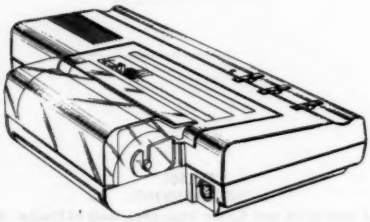
281,501
INTERPHONE
Hiroshi Yamagata, and Kendo Makihara, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 19, 1983, Ser. No. 496,117
Claims priority, application Japan, Nov. 30, 1982, 57-54176
Term of patent 14 years
U.S. Cl. D14—92



281,502
VIDEOCONFERENCING CONSOLE WITH MULTIPLE VIDEO TRANSMITTING AND RECEIVING DEVICES
William C. Wheeler, Conklin, N.Y., assignor to General Electric Company, Binghamton, N.Y.
Filed Sep. 30, 1982, Ser. No. 430,022
Term of patent 14 years
U.S. Cl. D14—102

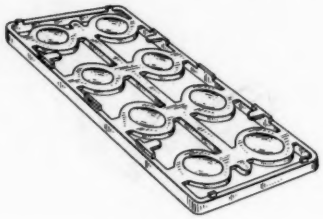


281,503
PRINTER
Ira L. Velinsky, Plainfield, N.J., assignor to Commodore Business Machines Inc., West Chester, Pa.
Filed Apr. 4, 1983, Ser. No. 481,871
Term of patent 14 years
U.S. Cl. D14—111



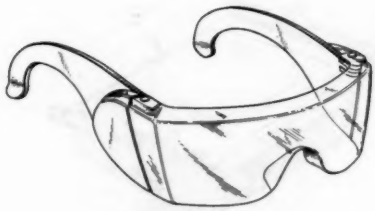
281,504
PROGRAM CARTRIDGE FOR A PERSONAL COMPUTER
Myron F. Davis; Willis Y. Jordan, III, and Robert Wysong, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 7, 1983, Ser. No. 529,906
Term of patent 14 years
U.S. Cl. D14—114

281,505
MOLDING FRAME FOR LENSES
Hans O. Larsen, Farum, and Ture Kindt-Larsen, Vedbaek, both of Denmark, assignors to Mia Lens Production A/S, Kobenhaunk, Denmark
Filed Oct. 17, 1983, Ser. No. 542,862
Term of patent 14 years
U.S. Cl. D15—136

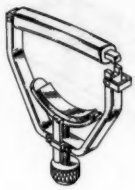


281,506
OVERHEAD PROJECTOR
Vincent E. DeLongis, Yonkers, N.Y., and Henry Kyhl, Leonia, N.J., assignors to Buhl Industries, Inc., Hawthorne, N.J.
Filed Apr. 29, 1983, Ser. No. 490,036
Term of patent 14 years
U.S. Cl. D16—24

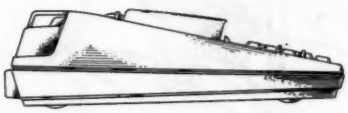
281,507
SPECTACLES
Paul M. Schremmer, Hunters Hill, Australia, assignor to Protector Safety Industries Limited, Guildford, Australia
Filed May 16, 1983, Ser. No. 495,043
Claims priority, application Australia, Feb. 14, 1983, 2885/83
Term of patent 14 years
U.S. Cl. D16—102



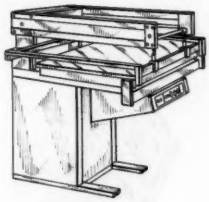
281,508
CAPO FOR A STRINGED MUSICAL INSTRUMENT
Thomas H. McKinney, III, 43 Lancelot La., Asheville, N.C. 28806
Filed Apr. 26, 1983, Ser. No. 488,714
Term of patent 14 years
U.S. Cl. D17—20



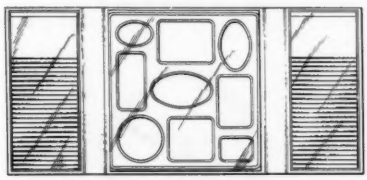
281,509
TYPEWRITER
John E. Jolliffe, Manlius, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Feb. 13, 1984, Ser. No. 579,629
Term of patent 14 years
U.S. Cl. D18—1



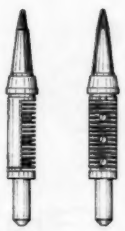
281,510
SCREEN PRINTING PRESS
Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Company, Chicago, Ill.
Filed Oct. 26, 1982, Ser. No. 436,661
Term of patent 14 years
U.S. Cl. D18—13



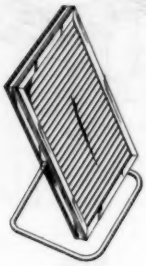
281,511
PHOTO ALBUM OR SIMILAR ARTICLE
Michael Brucoli, Stamford, Conn., assignor to The Holson Company, Wilton, Conn.
Filed Jun. 20, 1983, Ser. No. 505,889
Term of patent 14 years
U.S. Cl. D19—26



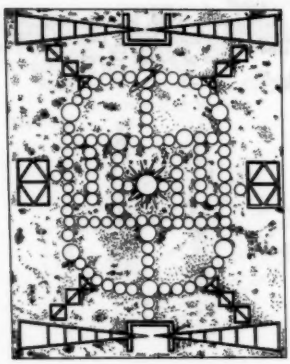
281,512
NIB FOR A FOUNTAIN PEN
Akio Kobori, Tokyo, Japan, assignor to The Sailor Pen Co., Ltd., Tokyo, Japan
Filed Jul. 13, 1983, Ser. No. 513,228
Claims priority, application Japan, Dec. 28, 1982, 57-57639
Term of patent 14 years
U.S. Cl. D19—55



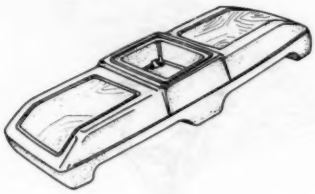
281,513
PORTABLE SIGN AND STAND THEREFOR
Christopher J. Ashton, Barnet, England, assignor to Marler Haley ExpoSystems, Limited, Barnet, England
Filed Mar. 17, 1982, Ser. No. 358,898
Claims priority, application United Kingdom, Sep. 17, 1981, 1002527
Term of patent 14 years
U.S. Cl. D20—21



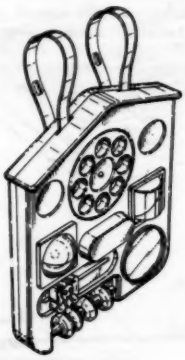
281,514
GAME BOARD
Steven R. Messmer, Rte. 1, Box 48, and Dean A. Pryor, 409 Third Ave., both of Jasper, Ind. 47546
Filed Jun. 6, 1983, Ser. No. 501,497
Term of patent 14 years
U.S. Cl. D21—31



281,515
GAME CONSOLE
Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.
Filed Dec. 27, 1982, Ser. No. 452,888
Term of patent 14 years
U.S. Cl. D21—48

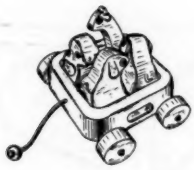


281,516
ACTIVITY TOY
Dennis C. L. Wong, Kowloon, Hong Kong, assignor to Deacon & Co. Limited, Kowloon, Hong Kong
Filed May 2, 1983, Ser. No. 490,427
Claims priority, application United Kingdom, Nov. 8, 1982, 1009610
Term of patent 14 years
U.S. Cl. D21—59

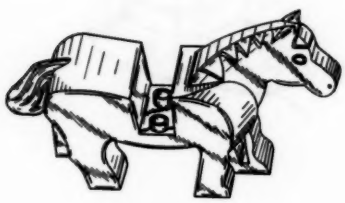


281,517
TOY TELEPHONE
Robert A. Kolich, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 7, 1984, Ser. No. 577,963
Term of patent 14 years
U.S. Cl. D21—111

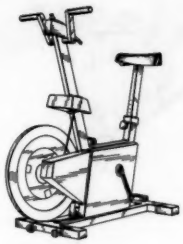
281,518
COMBINED TOY WAGON AND ANIMALS THEREFOR
John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Filed Dec. 15, 1982, Ser. No. 450,059
Term of patent 14 years
U.S. Cl. D21—149



281,519
TOY HORSE FIGURE
Niels M. Pedersen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 10, 1982, Ser. No. 448,751
Term of patent 14 years
U.S. Cl. D21—165

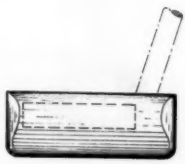


281,520
BICYCLE EXERCISER
Heikki A. Kiiski, Turku, Finland, assignor to Tunturipyora Oy, Turku, Finland
Filed Feb. 24, 1983, Ser. No. 469,268
Claims priority, application Finland, Aug. 26, 1982, 82725
Term of patent 14 years
U.S. Cl. D21—194



281,521
GAME FOOTBAG
Robert J. Stalberger, Jr., Vancouver, and LeRoy F. Kennedy, Camas, both of Wash., assignors to Kenncorp Sports, Inc., Vancouver, Wash.
Filed Apr. 5, 1983, Ser. No. 482,185
Term of patent 14 years
U.S. Cl. D21—203

281,522
GOLF PUTTER HEAD
Samuel J. Ehrlich, 19-08 Radburn Rd., Fair Lawn, N.J. 07410
Filed Nov. 25, 1981, Ser. No. 325,006
Term of patent 14 years
U.S. Cl. D21—219



281,523

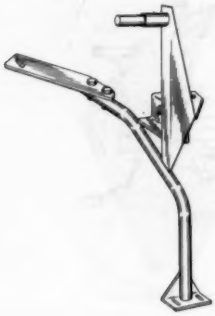
PIN SETTER RETURN TRACK MOUNTING BRIDGE

Richard D. Lenhart, Arvada, and Roger D. Lindblad, Westminster, both of Colo., assignors to Zot Manufacturing Company, Arvada, Colo.

Filed Apr. 18, 1983, Ser. No. 485,710

Term of patent 14 years

U.S. Cl. D21—233



281,524

FISH LURE

Gerard F. Yarusso, 13180 Oaklawn Dr., Shakopee, Minn. 55379

Filed Sep. 12, 1983, Ser. No. 531,057

Term of patent 14 years

U.S. Cl. D22—27

281,525

RESILIENT RING FOR FLUID COUPLING

Robert W. Gilbert, Adelaide, Australia, assignor to Mining Supplies (Minsup) Pty. Ltd., Edwardstown, Australia

Filed Dec. 28, 1981, Ser. No. 334,730

Claims priority, application Australia, Aug. 7, 1981, 84842

Term of patent 14 years

U.S. Cl. D23—47

281,526

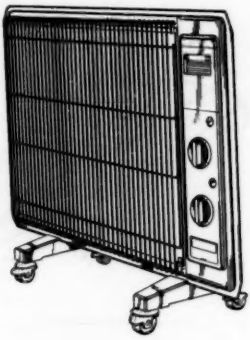
HEATING PLATE

Jaime F. Cenefels, Barcelona, Spain, assignor to Raivi S.A., Barcelona, Spain

Filed Oct. 27, 1981, Ser. No. 315,483

Term of patent 14 years

U.S. Cl. D23—123



281,527

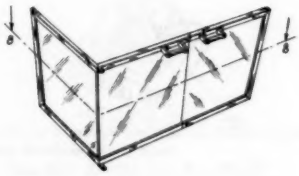
CORNER FIREPLACE DOORS AND PANEL

Robert J. Ehmke, W169 N10502 Pheasant Run, Germantown, Wis. 53022

Filed Aug. 29, 1983, Ser. No. 527,010

Term of patent 14 years

U.S. Cl. D23—128



281,528

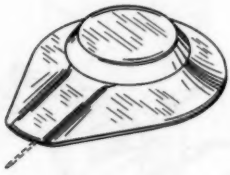
BODY MOUNTED PUMP FOR DISPENSING MEDICATION

John R. Peery, Palo Alto, and James B. Eckenhoff, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Dec. 23, 1982, Ser. No. 452,369

Term of patent 14 years

U.S. Cl. D24—8

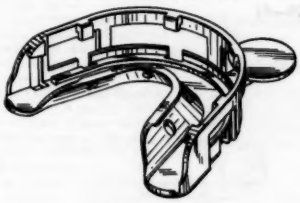


281,529
DENTAL TRAY
Paul Seid, New City, and Herbert Wolfe, Pomona, both of N.Y., assignors to Sultan Dental Products Ltd., Englewood, N.J.
Filed Jun. 13, 1983, Ser. No. 503,834
Term of patent 14 years
U.S. Cl. D24—10

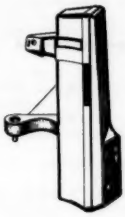
281,530
DENTAL TRAY
Paul Seid, New City, and Herbert Wolfe, Pomona, both of N.Y., assignors to Sultan Dental Products Ltd., Englewood, N.J.
Filed Jun. 13, 1983, Ser. No. 503,835
Term of patent 14 years
U.S. Cl. D24—10

281,531
TOOTH CROWN REMOVER
William H. Harris, 4513 S. Pennsylvania, Oklahoma City, Okla. 73119
Filed Feb. 22, 1983, Ser. No. 468,813
Term of patent 14 years
U.S. Cl. D24—10

281,532
DENTAL IMPRESSION TRAY
Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.
Filed Apr. 29, 1983, Ser. No. 489,943
Term of patent 14 years
U.S. Cl. D24—10



281,533
VISUAL ACUITY METER FOR MEASURING THE POTENTIAL VISUAL ACUITY OF THE EYE OF A PATIENT
Richard Seager, Mystic, Conn., assignor to Mentor O & O, Inc., Hingham, Mass.
Filed Aug. 25, 1982, Ser. No. 411,564
Term of patent 14 years
U.S. Cl. D24—17

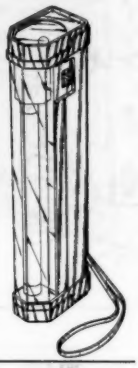


281,534
CONTAINER FOR A SAMPLE OF LIQUID SERUM OR THE LIKE
Masao Ushikubo, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Oct. 7, 1982, Ser. No. 433,265
Claims priority, application Japan, Apr. 10, 1982, 57-15431
Term of patent 14 years
U.S. Cl. D24—29

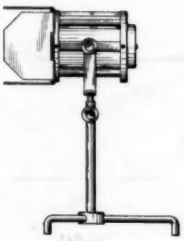
281,535
COMBINED MEDICAL SUCTION AND LAVAGE HANDPIECE OR THE LIKE
Robert W. Atkinson, Dover, and Daniel H. Olson, Louisville, both of Ohio, assignors to Snyder Laboratories, Inc., Dover, Ohio
Filed Dec. 1, 1982, Ser. No. 445,881
Term of patent 14 years
U.S. Cl. D24—51

281,536
ROOF TILE
Daniel O'Donnell, Coogee, Australia, assignor to Monier Limited, Australia
Filed Feb. 8, 1983, Ser. No. 465,007
Term of patent 14 years
U.S. Cl. D25—80

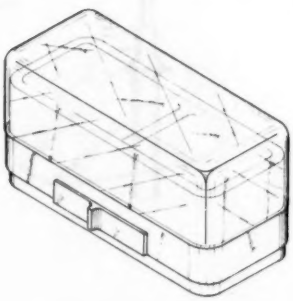
281,537
COMBINED LAMP AND TORCH
Tit-Wing Poon, 12F Lam Uk Village, Chaiwan, Hong Kong
Filed Sep. 22, 1982, Ser. No. 421,560
Claims priority, application United Kingdom, May 27, 1982, 1006957
The portion of the term of this patent subsequent to May 22, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—42



281,538
LAMP
Tony Wang, No. 30, Lane 194, Sung Chiang Rd., Taipei, Taiwan
Filed May 23, 1983, Ser. No. 496,900
Term of patent 14 years
U.S. Cl. D26—64



281,539
ELECTROSONIC CLEANING BATH ENCLOSURE
Mark Harrison, Portsmouth, R.I., assignor to Connoisseurs Products Corporation, Sommerville, Mass.
Filed Aug. 12, 1983, Ser. No. 522,483
Term of patent 14 years
U.S. Cl. D32—1



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TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF NOVEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
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AB Volvo: *See*—
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AB Wilh. Becker, Fack: *See*—
Smedberg, Olof R., 4,554,959, Cl. 144-380.000.

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Abe, Kunihiro: *See*—
Ohgami, Masaaki; Hara, Kazuo; and Abe, Kunihiro, 4,555,762, Cl. 364-431.090.

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Irvine, Michael D., 4,555,637, Cl. 290-52.000.

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Samson, Wilfred J.; and Solar, Ronald J., 4,554,929, Cl. 128-772.000.

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Distin, Robert G., Jr.; Lang, Thomas J.; and Smith, David E., 4,554,846, Cl. 74-805.000.

Advanced Micro Devices, Inc.: *See*—
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Rogers, Randall, deceased, 4,554,781, Cl. 56-235.000.

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Harrington, Richard F.; Dagiel, Richard T.; and Brown, Villy, 4,555,007, Cl. 192-98.000.

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Andersson, Henry, 4,554,843, Cl. 74-493.000.

Agapiou, Agapios; Allan, John L. H.; and Jacobson, Felix I., to Phillips Petroleum Company. Supported polyolefin catalyst components and methods of making and using the same. 4,555,496, Cl. 502-105.000.

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Vockenhuber, Peter, 4,555,632, Cl. 250-560.000.

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Bantz, Wesley R., 4,554,724, Cl. 29-451.000.

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Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,555,427, Cl. 428-195.000.

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Maehara, Toshifumi; and Yoshizawa, Hiroyuki, 4,555,145, Cl. 303-92.000.

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Sancini, Aldo; and Stacher, Miguel A., 4,554,950, Cl. 139-25.000.

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Benamy, Daniel A., 4,555,793, Cl. 377-48.000.
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Kissel, Gary T., 4,555,255, Cl. 55-355.000.

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Hanlet, Jacques M.; and Tarantino, Elia R. J., 4,554,908, Cl. 126-443.000.

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Schmitt, Joseph M., 4,555,367, Cl. 260-465.900.
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Calloway, Brian, 4,554,693, Cl. 5-448.000.

American Hospital Supply Corporation: *See*—
Stout, David M.; Yamamoto, Diane M.; and Barcelon-Yang, Cynthia, 4,555,517, Cl. 514-336.000.

American Microsystems, Inc.: *See*—
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American Safety Closure Corp.: *See*—
Conti, Vincent N., 4,555,039, Cl. 215-252.000.

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Kourimsky, Friedrich J. A., 4,555,156, Cl. 339-75.00M.
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Hull, Robert; and Lane, Joseph A., 4,555,253, Cl. 55-170.000.

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Crooke, Arthur W.; and Stebbins, Edwin E., 4,555,765, Cl. 364-571.000.

Anan, Yoshiaki: *See*—
Ishimitsu, Ikuo; Tokunaga, Toshimichi; Tanaka, Takeshi; and Anan, Yoshiaki, 4,555,126, Cl. 280-707.000.

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Danby, Hal C.; and Ritson, Carl, 4,554,837, Cl. 73-705.000.

Anchor, Michael J.: *See*—
Camp, Ronald L.; Dexheimer, Edward M.; and Anchor, Michael J., 4,555,549, Cl. 525-409.000.

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Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, to Schering Aktiengesellschaft. Novel 6, 16-dimethylcorticoids, their preparation and use. 4,555,507, Cl. 514-172.000.

Aoki, Tsutomu: *See*—
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Wyatt, Kenneth L., 4,555,105, Cl. 271-264.000.

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Atkins, Walter J., to Chrysler Corporation. Fuel conditioning device. 4,554,902, Cl. 123-557.000.

Atkinson, Robert W., to Snyder Laboratories, Inc. Moveable coil linear motor. 4,555,645, Cl. 310-27.000.

Atomic Energy of Canada Limited: *See*—
Buckley, Leo P.; Burrill, Kenneth A.; Desjardins, Conrad D.; and Salter, Robert S., 4,555,361, Cl. 252-626.000.

Atwood, Brian G.: *See*—
Hewett, Gary E.; Atwood, Brian G.; and Wennberg, Timothy J., 4,554,839, Cl. 73-864.160.

Atzbach, Carl L.: *See*—
Overley, Ronald V.; Tedhams, Michael H.; and Atzbach, Carl L., 4,554,907, Cl. 126-191.000.

Automotive Products plc: *See*—
Dixon, Alan G., 4,555,005, Cl. 192-70.270.

Avakian, Roger W., to General Electric Company. Stabilization of flame retardant polycarbonate-polyester compositions. 4,555,540, Cl. 524-130.000.

Averhoff, Wil W. Fence post driving and pulling apparatus. 4,555,090, Cl. 254-29.00R.

Awano, Koichi; Nitta, Yoshifumi; and Ibe, Satoshi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Niigata Kisetsu Kabushiki

Kaisha. Method for controlling temperature of water to be fed into water cooling tower. 4,554,964, Cl. 165-39.000.

Baba, Kiyokazu; and Nishida, Kenji, to Kabushiki Kaisha Komatsu Seisakusho. Method and device for separating and connecting transfer bar of three upright type transfer press. 4,555,012, Cl. 198-621.000.

Baba, Takao: *See*—
Asami, Kazuto; Baba, Takao; Nakamura, Minoru; and Tanaka, Mitsuaki, 4,554,775, Cl. 53-64.000.

Babb, Bruce E.: *See*—
LiMuti, Charles M.; Babb, Bruce E.; and Mauck, John C., 4,555,483, Cl. 435-19.000.

Bachynsky, Nicholas. Method for anti-cholinergic blockage of withdrawal symptoms in smoking cessation. 4,555,397, Cl. 424-10.000.

Backlund, Lars K., to Santrade Limited. Rotary drill bit. 4,554,985, Cl. 175-371.000.

Baggiolini, Deris: *See*—
Campello, Ugo; Racca, Enrico; Sosta, Pierluigi; and Baggiolini, Deris, 4,555,020, Cl. 206-235.000.

Bahl, Chander P.; and Nunberg, Jack, to Cetus Corporation. Method for using an amino-terminus DNA sequence to synthesize a specific double-stranded DNA. 4,555,486, Cl. 435-91.000.

Baker, Charles D., to Technical Research Associates, Inc. Polymethylmethacrylate bone cements and methods for preparing such bone cements. 4,554,686, Cl. 623-16.000.

Baker International Corporation: *See*—
Goodwin, Alton C.; Junglen, Mark T.; and Kent, John S., 4,554,963, Cl. 165-1.000.

Baker, Peter J., to General Motors Corporation. Combined spring mount and sectioned cage construction. 4,555,002, Cl. 192-45.000.

Baker, Ross G., Jr.; and Calfee, Richard V., to Intermedics, Inc. Microprocessor controlled cardiac pacemaker and method for avoiding pacer sustained tachycardia. 4,554,920, Cl. 128-419.0PG.

Baldry, Kenneth; and Davids, Martin, to Reuters Ltd. Conversational video system having local network control. 4,555,781, Cl. 370-60.000.

Ball Corporation: *See*—
Fights, Michael L.; and Jones, William E., 4,555,416, Cl. 427-248.100.

Ballato, Arthur: *See*—
Vig, John R.; and Ballato, Arthur, 4,554,717, Cl. 29-25.350.

Balzers Aktiengesellschaft: *See*—
Moll, Eberhard, 4,555,611, Cl. 219-121.000.

Bancware, Inc.: *See*—
Citron, Alan L.; Lindquist, Thomas W. F.; and Popp, William E., 4,555,699, Cl. 340-707.000.

Bandelow, Horst: *See*—
Simon, Fritz; Korber, Klaus; Bandelow, Horst; Scherer, Michael; Wilke, Dieter; Thron, Werner; and Preuk, Gerhard, 4,554,707, Cl. 17-47.000.

Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. Substituted 2(1H)-quinazolinone-1-alkanoic acids and esters. 4,555,571, Cl. 544-286.000.

Bandurco, Victor T.: *See*—
Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,555,570, Cl. 544-286.000.

Banister, Arthur J.; Hauptman, Zdenek V.; and Kendrick, Aidan G., to National Research Development Corporation. Synthesis of poly(sulphur nitride). 4,555,316, Cl. 204-59.00R.

Bansal, Jai P.; Bertin, Claude L.; and Troutman, Ronald R., to International Business Machines Corporation. Structure of stacked, complementary MOS field effect transistor circuits. 4,555,721, Cl. 357-42.000.

Bantz, Wesley R., to AGVS Installations, Inc. Method for installing an automatic guided vehicle system guide path. 4,554,724, Cl. 29-451.000.

Barazone, Mounque. Apparatus for laying paving fabric. 4,555,073, Cl. 242-86.50R.

Barbas, George A.: *See*—
Sheets, Ronald E.; Barbas, George A.; Doering, Howard W., Jr.; and Bjorkman, John R., 4,555,630, Cl. 250-492.100.

Barbieri, Stephen C.; and Mayer, Linda J., to OMI International Corporation. High speed copper electroplating process and bath therefor. 4,555,315, Cl. 204-52.00R.

Barcelon-Yang, Cynthia: *See*—
Stout, David M.; Yamamoto, Diane M.; and Barcelon-Yang, Cynthia, 4,555,517, Cl. 514-336.000.

Barnes, Phillip E.: *See*—
Anderson, Clifford E.; Simon, Clarence E.; and Barnes, Phillip E., 4,555,084, Cl. 248-460.000.

Barrett, Robert C.; Buscher, John H.; and Putnam, William M., to Eastman Machine Company. Apparatus for supporting and guiding machine for operating on sheet material such as cloth. 4,554,738, Cl. 30-275.000.

Barrett, Terence W., to United States of America, Navy. Method and apparatus for detecting singlet state resonance fluorescence. 4,555,177, Cl. 356-318.000.

Barron, Kimball R.: *See*—
Claney, Robert L.; Walton, Herbert H.; Kehoe, Steven D.; and Barron, Kimball R., 4,554,943, Cl. 137-242.000.

Barry, George W. J.: *See*—
O'Dowd, Dennis H.; and Barry, George W. J., 4,555,347, Cl. 210-752.000.

Barry, Judith A. Automatic depth-determining aquatic sampling device. 4,554,826, Cl. 73-170.00A.

Bartels, Willi. Nutcracker. 4,554,737, Cl. 30-120.300.

Barthell, Barry L.: *See*—
Duchane, David V.; and Barthell, Barry L., 4,555,313, Cl. 204-3.000.

Barzynski, Helmut; and Holoch, Klaus, to BASF Aktiengesellschaft. Image-recording materials and image-recording carried out using these. 4,555,471, Cl. 430-273.000.

BASF Aktiengesellschaft: *See*—
Barzynski, Helmut; and Holoch, Klaus, 4,555,471, Cl. 430-273.000.

BASF Wyandotte Corporation: *See*—
Camp, Ronald L.; Dexheimer, Edward M.; and Anchor, Michael J., 4,555,549, Cl. 525-409.000.
Christman, Donald L., 4,555,531, Cl. 521-167.000.
Heyman, Duane A., 4,555,527, Cl. 521-67.000.
Patton, John T., Jr.; and Rupert, John P., 4,555,530, Cl. 521-131.000.

Battelle Development Corporation: *See*—
Rodgers, Stephen D.; Dick, Richard J.; and McGinnis, Vincent D., 4,555,366, Cl. 260-404.800.

Batters, Robert C. Electrical therapeutic assembly and method for reducing pain and edema in a hand. 4,554,923, Cl. 128-421.000.

Bauer, Denise; Komornicki, Jacques; and Tellier, Jacques, to Societe Nationale Elf Aquitaine. Process of liquid-liquid extraction of metals, with the aid of a microemulsion, from an aqueous solution. 4,555,343, Cl. 210-643.000.

Bauer, Fritz; Bauer, Hans-Peter; and Bauer, Hans Jurgen, to Bauer, Fritz; and Sohne oHG. Lockable tilting apparatus for chair seats. 4,555,085, Cl. 248-561.000.

Bauer, Hans Jurgen: *See*—
Bauer, Fritz; Bauer, Hans-Peter; and Bauer, Hans Jurgen, 4,555,085, Cl. 248-561.000.

Bauer, Hans-Peter: *See*—
Bauer, Fritz; Bauer, Hans-Peter; and Bauer, Hans Jurgen, 4,555,085, Cl. 248-561.000.

Baughman, Gary M.: *See*—
Hamman, Martin E.; and Baughman, Gary M., 4,555,048, Cl. 222-478.000.

Baumgart, Helmut: *See*—
Arnold, Emil; Baumgart, Helmut; and Rossi, Barbara A., 4,555,300, Cl. 156-613.000.

Bausch & Lomb Incorporated: *See*—
Bridson, William D.; and Esmay, Edward N., 4,555,620, Cl. 250-205.000.
Huckenbeck, Claus O., 4,554,744, Cl. 33-241.000.
Kunzler, Wilhelm F.; and Coombs, William F., 4,555,372, Cl. 264-2.100.

Bay Mills Limited: *See*—
Boucher, Ray, 4,555,298, Cl. 156-523.000.

Bayer Aktiengesellschaft: *See*—
Beck, Gunther, 4,555,577, Cl. 548-200.000.
Goldmann, Siegfried; Bossert, Friedrich; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,555,512, Cl. 514-302.000.
Klauke, Erich; and Findeisen, Kurt, 4,555,370, Cl. 260-545.00R.
Schutze, Detlef-Ingo; Schmitz, Reinold; and Wunderlich, Klaus, 4,555,580, Cl. 549-52.000.

Bayer, Helmut, to Electrovac, Fabrikation elektrotechnischer Spezialartikel Gesellschaft mbH. Thermostat for cooking utensil. 4,555,688, Cl. 337-394.000.

Bayerische Motoren Werke AG: *See*—
Lobe, Hartwig, 4,555,638, Cl. 307-10.00R.

Bayorgeon, Jeffrey T.: *See*—
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., 4,555,091, Cl. 254-267.000.

BBC Brown, Boveri and Company, Limited: *See*—
Hausler, Michael; Huber, Philippe; Pfyl, Walter; and Sadek, Kadry, 4,555,658, Cl. 323-210.000.

Beck, Gunther, to Bayer Aktiengesellschaft. 2,4-Dichloro-5-thiazolecarboxaldehyde and a process for its preparation. 4,555,577, Cl. 548-200.000.

Becton, Dickinson and Company: *See*—
Bennett, Michael C., 4,555,046, Cl. 222-189.000.
Nugent, Edward L.; and Lutkowski, Lawrence, 4,555,336, Cl. 210-232.000.
Nugent, Edward L., 4,555,341, Cl. 210-359.000.

Bedini, John C., to TVI Systems, Ltd. Monaural to binaural audio processor. 4,555,795, Cl. 381-17.000.

Bednarek, Milan B.; and Houze, Eric C., to Du Pont de Nemours, E. I., and Company. Acrylic polyurethane coating composition. 4,555,535, Cl. 524-40.000.

Beecham Group p.l.c.: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,555,509, Cl. 514-278.000.
Milner, Peter H., 4,555,363, Cl. 260-239.100.

Beehive International: *See*—
Sharma, Gulab, 4,555,649, Cl. 315-382.000.

Beesley, Graham E., to Sinclair Research Limited. F.M. Amplifier for use in I.F. Stages. 4,555,677, Cl. 330-302.000.

Behrens, Gunter; Schmitz, Walter; Kitzer, Peter; and Rusch, Dieter, to Licentia Patent Verwaltungs-GmbH. Foldable solar cell panel apparatus. 4,555,585, Cl. 136-245.000.

Beitz, James V., to United States of America, Energy. Removal of fluoride impurities from UF_6 gas. 4,555,318, Cl. 204-157.10R.

Bekkers, Henricus A. M.; and Reyenga, Tjerk, to Technoplast B.V. Safety closure. 4,555,036, Cl. 215-220.000.

Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, to ITT Industries, Inc. Method and apparatus

for controlling and monitoring hydraulic brake slip. 4,555,144, Cl. 303-92.000.

Belly, Robert T.: *See*—
Frank, David S.; and Belly, Robert T., 4,555,396, Cl. 424-3.000.

Benamy, Daniel A., to Allied Corporation. Averaging non-integer frequency division apparatus. 4,555,793, Cl. 377-48.000.

Bendix Corporation: *See*—
Sorensen, Ian W.; and Kiwak, Robert S., 4,555,393, Cl. 423-447.100.

Benham, Thomas, to Mallinckrodt, Inc. Method and apparatus for punching holes in polymer tubes. 4,554,849, Cl. 83-40.000.

Benier B.V.: *See*—
Benier, Johan, 4,555,226, Cl. 425-96.000.

Benier, Johan, to Benier B.V. Apparatus for rolling dough and coiling it. 4,555,226, Cl. 425-96.000.

Bennett, Michael C., to Becton, Dickinson and Company. Pouring spout for a container and a container assembly including same. 4,555,046, Cl. 222-189.000.

Benson, Clark K.: *See*—
Caridis, Andrew A.; Benson, Clark K.; and Klein, Lawrence F., 4,554,865, Cl. 99-353.000.

Benson, Warren E.; and Breen, Stanley, to Forte Technology, Inc. Method and apparatus for determining dielectric constant. 4,555,661, Cl. 324-61.00R.

Ber-Vac Inc.: *See*—
Vachon, Bertrand, 4,554,977, Cl. 172-177.000.

Berenato, Joseph W., III; Raivel, Earl L., Jr.; and Strepelis, John J., to Bethlehem Steel Corporation. Semi-automatic pusher machine leveler bar control and method. 4,555,209, Cl. 414-163.000.

Beresniewicz, Aleksander, to Du Pont de Nemours, E. I., and Company. Tertiary perfluorinated compounds as rate enhancing additives in PTFE dispersion polymerization. 4,555,556, Cl. 526-212.000.

Bergmann, Konrad, to American Standard Inc. Straight-way valve. 4,554,948, Cl. 137-625.310.

Bernard Dalsin Manufacturing Company: *See*—
Dalsin, Bernard L., 4,554,863, Cl. 98-59.000.

Bernhardt, Daniel. Anti-spill recloseable container. 4,555,043, Cl. 220-306.000.

Bernhardt, Daniel. Tamperproof food package. 4,555,056, Cl. 229-45.00R.

Bernstein, Lawrence, to AT&T Bell Laboratories. Fast response for switched data networks. 4,555,774, Cl. 364-900.000.

Bertin, Claude L.: *See*—
Bansal, Jai P.; Bertin, Claude L.; and Troutman, Ronald R., 4,555,721, Cl. 357-42.000.

Bethlehem Steel Corporation: *See*—
Berenato, Joseph W., III; Raivel, Earl L., Jr.; and Strepelis, John J., 4,555,209, Cl. 414-163.000.

Betts, William L.; and Martinez, Kenneth. Digital modem having a monitor for signal-to-noise ratio. 4,555,790, Cl. 375-39.000.

Betz Laboratories, Inc.: *See*—
Reid, Dwight K., 4,555,326, Cl. 208-48.00R.

Bhatia, Vinay K., to F. L. Smidth & Co. A/S. Method for removing sulfur oxides from hot flue gases. 4,555,390, Cl. 423-242.000.

Biadigo, Mario; and Zucchi, Gianfranco, to Ideal Standard S.p.A. Automatic machine for the internal fettling of sanitary appliances. 4,555,229, Cl. 425-267.000.

Bialobrzeski, Walter: *See*—
Martin, Richard A.; and Bialobrzeski, Walter, 4,555,378, Cl. 264-292.000.

Bianchi, Angelo, to Sant-Andrea Novara Officine Meccaniche e Fonderie S.p.A. Chain-driven comb head for slivers of textile fibres, particularly for drawing frames. 4,554,709, Cl. 19-218.000.

Biermann, Eberhard, to Robert Bosch GmbH. Damping device of an air flow rate meter disposed in the air intake tube of an internal combustion engine. 4,554,825, Cl. 73-118.000.

Billings, Robert C.: *See*—
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., 4,555,091, Cl. 254-267.000.

Binder, Berthold; and Purrer, Josef, to Kloeckner-Humboldt-Deutz AG. Chopping arrangement. 4,555,065, Cl. 241-241.000.

Bird, Graham J.: *See*—
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Houston, Timothy L., 4,555,263, Cl. 71-98.000.

Bishopbarn Limited: *See*—
Franklin, Kenneth W., 4,555,013, Cl. 198-689.100.

Bissett, Donald L.; and Mao, Mark H. K., to Procter & Gamble Company, The. Mild detergent compositions. 4,555,360, Cl. 252-541.000.

Bjorkelund, Mats, to Kockumation AB, Remadivisionen. Photoelectric dimension measuring system. 4,555,633, Cl. 250-560.000.

Bjorkman, John R.: *See*—
Sheets, Ronald E.; Barbas, George A.; Doering, Howard W., Jr.; and Bjorkman, John R., 4,555,630, Cl. 250-492.100.

Blackmore, Phillip W., to Fiberglas Canada Inc. Bales of bagged batts. 4,555,017, Cl. 206-83.500.

Blair Industries, Inc.: *See*—
Graetz, Herbert; and Unterreiner, Ronald C., 4,555,290, Cl. 156-245.000.

Blanc, Andre : *See*—
Bloemkolk, Willem, deceased; and Blanc, Andre , 4,555,373, Cl. 264-25.000.

Blanchandin, Monique; Girardat, Roland; and Vanestrenvord, Jean-Michel, to Thomson CSF. Device for compensating temperature drifts of the gain of an ultra-high frequency electric signal amplifier. 4,555,675, Cl. 330-289.000.

Blase, Helmut; and Eiler, Peter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Vehicular crane of high carrying capacity having an extensible arm. 4,555,031, Cl. 212-189.000.

Bleckmann, Hans-Wilhelm: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,555,144, Cl. 303-92.000.

Bliss, Dan E.: *See*—
Fletcher, Aaron N.; McManis, George E., III; and Bliss, Dan E., 4,555,455, Cl. 429-112.000.

Bloemkolk, Christiane, legal representative: *See*—
Bloemkolk, Willem, deceased; and Blanc, Andre , 4,555,373, Cl. 264-25.000.

Bloemkolk, Willem, deceased (by Bloemkolk, Christiane, legal representative); and Blanc, Andre , to Vitrotex Saint-Gobain. Pressing of reinforced thermosetting polymer articles. 4,555,373, Cl. 264-25.000.

Blomley, Peter F., to International Standard Electric Corporation. Loudspeaking telephones. 4,555,596, Cl. 179-81.00B.

Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., to Taprogge Gesellschaft mbH. Ball-measuring system for self-cleaning heat exchanger. 4,554,965, Cl. 165-95.000.

Bodet, Jean A.: *See*—
Chazal, Guy A.; and Bodet, Jean A., 4,555,381, Cl. 264-516.000.

Boeckmann, Eduard F. B.; and Woodworth, Larry A., to GTE Business Communication Systems Inc. Transient resistant key operated pulse generating calling device circuit. 4,555,597, Cl. 179-90.00B.

Boehringer Ingelheim KG: *See*—
Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, 4,555,511, Cl. 514-301.000.

Boettcher, Irmgard: *See*—
Rufer, Clemens; and Boettcher, Irmgard, 4,555,406, Cl. 514-605.000.

Bogdanov, Vladimir M.: *See*—
Vasiliev, Leonard L.; Kiselev, Vladimir G.; Morgun, Valery A.; Marchenko, Anatoly M.; Rudnev, Evgeny A.; Nesvit, Vasily A.; Dunaevsky, Leonid M.; Tverdokhleb, Nikolai F.; Bogdanov, Vladimir M.; and Rabetsky, Mikhail I., 4,554,966, Cl. 165-104.210.

Boger, Manfred; and Drabek, Jozef, to Ciba Geigy Corporation. Carbamic acid esters useful as pesticides. 4,555,405, Cl. 514-488.000.

Bohler, Udo: *See*—
Lange, Wolf-Ruediger; Wessel, Anton; Bohler, Udo; Volkheimer, Klaus; Greiner, Gunter; and Islet, Peter, 4,555,806, Cl. 455-62.000.

Bonicel, Jean-Pierre; Prigent, Madeleine; and Cottevieille, Christian, to Les Cables de Lyon, S.A. Fireproof polymer material. 4,555,539, Cl. 524-127.000.

Bonn, John: *See*—
Graham, Wayne B.; and Bonn, John, 4,554,743, Cl. 33-172.00R.

Bonnet, Bernard; Bressy, Roger; and Sevaille, Jean-Claude, to Commissariat a l'Energie Atomique. Automatic high insulation switch. 4,555,640, Cl. 307-115.000.

Borden, Albert R., to United States of America, Energy. Method and apparatus for making superconductive magnet coils. 4,554,731, Cl. 29-605.000.

Borel, Georg; and Waldvogel, Hartmut, to Hermann Wangner GmbH & Co. Composite fabric for use as clothing for the sheet forming section of a papermaking machine. 4,554,953, Cl. 139-383.00A.

Borg-Warner Corporation: *See*—
Habel, Paul A.; and Kulczycki, Elaine S., 4,555,009, Cl. 192-106.200.

Boris, Allen J.: *See*—
Lockard, Walter G.; Patel, Nathalal G.; and Boris, Allen J., 4,555,121, Cl. 280-30.000.

Born, Siegfried, to Hauni-Werke Korber & Co. KG. Apparatus for severing rod-shaped articles of the tobacco processing industry. 4,554,931, Cl. 131-84.400.

Borovian, Gayle E., to Lever Brothers Company. Synergistic preservative compositions. 4,555,400, Cl. 424-78.000.

Bossennec, Jean-Louis G.; Debuisser, Jean-Claude A.; and Farhi, Philippe F., to International Standard Electric Corporation. System for providing a summarized information on the line spectrum from a Doppler radar spectrum analyzer. 4,555,705, Cl. 343-55.00A.

Bosserl, Friedrich: *See*—
Goldmann, Siegfried; Bossert, Friedrich; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,555,512, Cl. 514-302.000.

Bosshart, John; and Allen, William W., to Jensen Corporation. Heated cylinder ironer utilizing a flexible ironing bed. 4,554,752, Cl. 38-61.000.

Bossons, William R., to W. H. Bossons (Sales) Limited. Wall plaques. 4,555,432, Cl. 428-156.000.

Boucher, Ray, to Bay Mills Limited. Tape gun. 4,555,298, Cl. 156-523.000.

Bouliane, Daniel. Trailer gear for small craft. 4,554,884, Cl. 114-344.000.

Boute, Wim; Wittkampf, Frederik H. M.; and van Arragon, Gerrit W., to Vitafin N.V. Dual chamber pacemaker with automatic high rate limit mode determination. 4,554,921, Cl. 128-419.0PG.

Boyd, Mary G.: *See*—
Geurtsen, Friedrich H. H.; Anemaet, John M.; Smith, Donald R.; and Boyd, Mary G., 4,555,436, Cl. 428-200.000.

Boyle, William H., to Envirex Inc. Excess overflow orifice tubes. 4,555,340, Cl. 210-248.000.

Bradfield, James E.: *See*—
Stanley, Roderic K.; Milewits, Marvin; Knauer, Robert C., Jr.; and Bradfield, James E., 4,555,665, Cl. 324-229.000.

Bradley, Irving, to General Electric Company. Truncated motor vehicle headlamp. 4,555,748, Cl. 362-61.000.

Bradshaw, Larry R.: *See*—
Womack, Darryl L.; Noell, Ralph B.; and Bradshaw, Larry R., 4,554,913, Cl. 128-80.00C.

Bradsher, O. D., Jr.: *See*—
Molloy, Michael P., 4,554,758, Cl. 43-61.000.

Brantl, Victor; Teschemacher, Hansjorg; Henschen, Agnes; and Lottspeich, Friedrich. Pharmacologically active peptides and medicaments containing the same. 4,555,403, Cl. 514-17.000.

Breedis, John F.: *See*—
Ashok, Sankaranarayanan; and Breedis, John F., 4,555,272, Cl. 148-3.000.

Breen, Stanley: *See*—
Benson, Warren E.; and Breen, Stanley, 4,555,661, Cl. 324-61.00R.

Bressy, Roger: *See*—
Bonnet, Bernard; Bressy, Roger; and Sevaille, Jean-Claude, 4,555,640, Cl. 307-115.000.

Brettbacher, Franz: *See*—
Hirschmanner, Franz; Buchegger, Rudolf; and Brettbacher, Franz, 4,554,812, Cl. 72-202.000.

Breville Holdings Pyt. Limited: *See*—
O'Brien, William J., 4,555,616, Cl. 219-432.000.

Bricaud, Herve ; and L'Henaff, Patrick, to Socapex. Connector comprising at least one contact having a resiliently deformable arm. 4,555,153, Cl. 339-17.0CF.

Brick, Michael J.; and Dirnberger, Linus R., to Westinghouse Electric Corp. Elevator system with lamp status and malfunction monitoring. 4,555,689, Cl. 340-19.00R.

Bridgewater, Walter F.; De Caro, Robert E.; Larson, Roger; and Wall, Llewellyn E., to Irvine Sensors Corporation. Pre-amplifier in focal plane detector array. 4,555,623, Cl. 250-214.00A.

Bridson, William D.; and Esmay, Edward N., to Bausch & Lomb Incorporated. Automatic illumination control for multi-objective optical instruments such as microscopes. 4,555,620, Cl. 250-205.000.

Briggs, James B., to Media Transference International. Single channel split-sound receiver for use with television set. 4,555,730, Cl. 358-142.000.

Brightman, Barrie; Elliott, George; Lenk, Pedro A.; Shah, Jayantkumar R.; and Stewart. William H., to Stromberg-Carlson Corp. Sampled port data switching system employing interactive processors. 4,555,595, Cl. 179-18.0ES.

British Aerospace Public Limited Company: *See*—
Clark, Frederick; and Moore, Colin, 4,555,698, Cl. 340-680.000.

Broadbent, William H., Jr.; Buchholz, Steve; Eldredge, Peter; and Wihl, Mark J., to KLA Instruments Corporation. Automatic system and method for inspecting hole quality. 4,555,798, Cl. 382-8.000.

Bronfenbrenner, James C.; Foster, Edward P.; and Tewari, Krishna, to International Coal Refining Company. Process for stabilizing the viscosity characteristics of coal derived materials and the stabilized materials obtained thereby. 4,555,248, Cl. 44-78.000.

Bronn, William R., to Riker Laboratories, Inc. Certain 6-benzamidomethyl-2(1H)-pyridone derivatives. 4,555,573, Cl. 546-291.000.

Brooks, Ralf M.; and Lepic, Daniel A., to NCR Canada Ltd.-NCR Canada Ltee. Concurrent, image-based, reject-re-entry repair system and method. 4,555,617, Cl. 235-379.000.

Brot, Michel: *See*—
Vegeais, Patrick; Brot, Michel; and Valet, Jean-Yves, 4,555,715, Cl. 346-76.0PH.

Brown, Anthony R., to Molins PLC. Conveying rod-like articles. 4,555,011, Cl. 198-444.000.

Brown, Donald G. Passageway selective detector mechanism and system. 4,555,696, Cl. 340-551.000.

Brown, Richard K.; and Seiferth, Oscar E., to James River-Norwalk, Inc. Package assembly and method for storing and microwave heating of food. 4,555,605, Cl. 219-10.55E.

Brown, Villy: *See*—
Harrington, Richard F.; Dagiel, Richard T.; and Brown, Villy, 4,555,007, Cl. 192-98.000.

Bruins, Henderikus B.: *See*—
Kramer, Franklin; Bruins, Henderikus B.; Giacone, Joseph; and Carbillet, Luc L., 4,555,407, Cl. 426-5.000.

Brulard, Michel C., to Jeumont-Schneider Corporation. Control circuit for operating a direct current motor during traction or braking. 4,555,652, Cl. 318-375.000.

Brumfield, David L., to Richards Medical Company. Bone fixation frame. 4,554,915, Cl. 128-92.00A.

Bruns, Angelika: *See*—
Harms, Margret; Bruns, Angelika; Luthje, Holger; and Matthiessen, Bernd, 4,555,460, Cl. 430-5.000.

Bruns, Engelbert; and Osterholt, Gerd, to Carl Still GmbH & Co. K.G., Firma. Gas collecting hood for collecting emissions during coke discharge operations. 4,555,308, Cl. 202-263.000.

Bruns, Klaus; and Weber, Ursula, to Henkel Kommanditgesellschaft auf Aktien. Trimethylbicyclo [4.3.0] non-1-ene derivatives. 4,555,359, Cl. 252-522.00R.

Bruyere, Michel: *See*—
Delor, Michel; and Bruyere, Michel, 4,555,382, Cl. 376-216.000.

Bryant, William E., to Sanders Associates, Inc. Apparatus and method for channel identification. 4,555,807, Cl. 455-137.000.

Buchar, Wayne A., to Xerox Corporation. Illumination control system utilizing an integrating feedback detector. 4,555,621, Cl. 250-205.000.

Buchegger, Rudolf: *See*—
Hirschmanner, Franz; Buchegger, Rudolf; and Brettbacher, Franz, 4,554,812, Cl. 72-202.000.

Buchholz, Steve: *See*—
Broadbent, William H., Jr.; Buchholz, Steve; Eldredge, Peter; and Wihl, Mark J., 4,555,798, Cl. 382-8.000.

Buckingham, Robin E.: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,555,509, Cl. 514-278.000.

Buckley, Leo P.; Burrill, Kenneth A.; Desjardins, Conrad D.; and Salter, Robert S., to Atomic Energy of Canada Limited. Method of reducing the volume of solid radioactive waste. 4,555,361, Cl. 252-626.000.

Budd Company, The: *See*—
Dickhart, William W., III; Graziani, Dante J., Jr.; Herring, James M., Jr.; Pavlick, Michael J.; and Renn, Edward J., 4,555,095, Cl. 267-4.000.

Budecker, Ludwig; and Obersteiner, Georg, to ITT Industries, Inc. Radial piston machine. 4,555,223, Cl. 417-462.000.

Buell, Kenneth B., to Procter & Gamble Company, The. Waste-containment garment having absorbent body and reuseable side-bridging fastener fitments. 4,555,244, Cl. 604-392.000.

Bumberger, Herbert: *See*—
Schiefer, Bernhard; and Bumberger, Herbert, 4,555,050, Cl. 222-597.000.

Burgdorf, Jochen: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,555,144, Cl. 303-92.000.

Burke, Thomas M.: *See*—
Westervelt, Dean C.; and Burke, Thomas M., 4,554,730, Cl. 29-605.000.

Burkhalter, John F.: *See*—
Rao, S. Prabhakara; and Burkhalter, John F., 4,555,269, Cl. 106-90.000.

Burnham, Robert D.: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,555,785, Cl. 372-8.000.

Burns & Russell Company: *See*—
Sergovic, John A.; and McClinton, John L., 4,555,375, Cl. 264-259.000.

Burny, Camille J., Jr. Rotatable flag support. 4,554,885, Cl. 116-174.000.

Burr, John E., to M/A-COM, Inc. Magnetron tuned programmably using step motor. 4,555,680, Cl. 331-86.000.

Burrill, Kenneth A.: *See*—
Buckley, Leo P.; Burrill, Kenneth A.; Desjardins, Conrad D.; and Salter, Robert S., 4,555,361, Cl. 252-626.000.

Burris, W. Alan. Ozonator feed system. 4,555,335, Cl. 210-192.000.

Burroughs Corporation: *See*—
Donkin, Charles W., 4,555,189, Cl. 384-493.000.

Burroughs, Robert C. Return top. 4,555,235, Cl. 446-250.000.

Burroughs Wellcome Co.: *See*—
Jones, Harry P., 4,555,504, Cl. 514-26.000.

Burtch, John E.; and Hill, James A., to Owens-Illinois, Inc. Universal hot air nozzle and seal bar with adjustable cam. 4,555,296, Cl. 156-446.000.

Burton, James A., to Hydril Company. Apparatus for forming boreholes. 4,554,982, Cl. 175-75.000.

Burwell, Reed & Kinghorn Limited: *See*—
Williamson, Terence J., 4,555,259, Cl. 65-374.120.

Burzin, Klaus: *See*—
Droescher, Michael; Mumcu, Salih; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, 4,555,550, Cl. 525-424.000.

Buscher, John H.: *See*—
Barrett, Robert C.; Buscher, John H.; and Putnam, William M., 4,554,738, Cl. 30-275.000.

Buschor, Josef J., to Five X Corporation. Workpiece holding and positioning mechanism and system. 4,555,216, Cl. 414-728.000.

Butenschon, Rolf, to GIVAG Gastro-Installationen-Vertrieb (Deutschland) GmbH. Glass with stem, particularly a wine glass. 4,555,040, Cl. 215-365.000.

Butler, John D., to Federal-Mogul Corporation. Molding an elastomeric ring while bonding it to a metal case and to a fluorocarbon washer. 4,555,376, Cl. 264-266.000.

Butterworth, Robert M.; and Wells, Martin A., to Lever Brothers Company. Fabric softening compositions. 4,555,349, Cl. 252-8.600.

Byer, Robert L., to Leland Stanford, Jr. University, Board of Trustees of. High power solid state laser. 4,555,786, Cl. 372-70.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Rainer, Georg, 4,555,518, Cl. 514-338.000.

Byrne, David S.; and Chen, Evan N., to Warner-Lambert Company. Disposable razor rack. 4,555,030, Cl. 211-49.100.

Cabot Corporation: *See*—
Getz, Marlyn F., 4,555,268, Cl. 75-229.000.

Cadbury Schweppes, Plc: *See*—
Jeans, Edward L., 4,555,371, Cl. 261-122.000.

Cadoret, Genevieve L. Men's combination briefs and hose. 4,554,684, Cl. 2-227.000.

Calfee, Richard V.: *See*—
Baker, Ross G., Jr.; and Calfee, Richard V., 4,554,920, Cl. 128-419.0PG.

Calloway, Brian, to American Fast Print Limited. Mattress, box springs fabric. 4,554,693, Cl. 5-448.000.

Calvert, Rodney K., to Mead Corporation, The. Packaging machine and method. 4,554,778, Cl. 53-398.000.

Camp, Ronald L.; Dexheimer, Edward M.; and Anchor, Michael J., to BASF Wyandotte Corporation. Polyoxyalkylene polymers as lubricants particularly in molding processes. 4,555,549, Cl. 525-409.000.

Campbell, Robert: *See—*
Yoakam, David; Campbell, Robert; and Pehkonen, Robert, 4,554,887, Cl. 118-666.000.
Campbell, Robert K.: *See—*
Weinstein, Richard; Davis, James W.; and Campbell, Robert K., 4,555,058, Cl. 239-223.000.
Campbell Soup Company: *See—*
von Lersner, Wolf A.; Cheeseman, Edward W.; Simpson, Thomas K.; and Weaver, George R., 4,554,955, Cl. 141-1.000.
Campello, Ugo; Racca, Enrico; Sosta, Pierluigi; and Baggiolini, Deris, to New High Glass. Compact. 4,555,020, Cl. 206-235.000.
Canivet, Patrick: *See—*
de la Mettrie, Roland; and Canivet, Patrick, 4,555,247, Cl. 8-405.000.
Canning, Howard; and Weber, Peter, to Twinpak, Inc. Pouch handle. 4,555,804, Cl. 383-25.000.
Canon Kabushiki Kaisha: *See—*
Hasegawa, Tetsuo; and Suematsu, Koushi, 4,555,467, Cl 430-110.000.
Katagiri, Kazuharu; and Oguchi, Yoshihiro, 4,555,472, Cl. 430-278.000.
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,555,465, Cl. 430-95.000.
Suda, Yasuo; Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; and Ohtaka, Keiji, 4,555,169, Cl. 354-407.000.
Canron Corp.: *See—*
Coy, Calvin L.; and O'Neal, Keith T., 4,554,697, Cl. 15-55.000.
Cantrell, Ben H., to United States of America, Navy. Environmental mapping system. 4,555,703, Cl. 343-5.0SA.
Capintec Inc.: *See—*
Suzuki, Arata, 4,555,626, Cl. 250-239.000.
Capocci, Gerald A.: *See—*
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., 4,555,541, Cl. 524-180.000.
Capps, David B., to Warner-Lambert Company. Pyrazolo[3,4,5-kl]acridine compositions and methods for their production and use. 4,555,572, Cl. 546-14.000.
Carbillet, Luc L.: *See—*
Kramer, Franklin; Bruins, Henderikus B.; Giacone, Joseph; and Carbillet, Luc L., 4,555,407, Cl. 426-5.000.
Cardin, Wilfred W.: *See—*
Pejouhy, Radi; and Cardin, Wilfred W., 4,555,686, Cl. 337-102.000.
Caridis, Andrew A.; Benson, Clark K.; and Klein, Lawrence F., to Heat and Control, Inc. Taco shell forming and cooking apparatus. 4,554,865, Cl. 99-353.000.
Carithers, Val G.: *See—*
Watson, David R.; Carithers, Val G.; and McDaniel, L. Thomas, 4,555,493, Cl. 501-127.000.
Carl Still GmbH & Co. K.G., Firma: *See—*
Bruns, Engelbert; and Osterholt, Gerd, 4,555,308, Cl. 202-263.000.
Carl Walther GmbH: *See—*
Repa, Otto, 4,554,745, Cl. 33-257.000.
Carlson, David J., to RCA Corporation. R.F. Diplexing and multiplexing means. 4,555,809, Cl. 455-190.000.
Carnavos, Theodore C., to Noranda Metal Industries, Inc. Coaxial finned tube heat exchanger. 4,554,969, Cl. 165-154.000.
Carnegie-Mellon University: *See—*
Prinz, Friedrich B.; Hoburg, James F.; and Gunnarsson, Kristjan, 4,554,834, Cl. 73-597.000.
Carobbi, Renato; Miletti, Sandro; and Franci, Vittorio, to Sirac SpA. Process for purifying lactulose syrup. 4,555,271, Cl. 127-46.200.
Carpenter Paper Company: *See—*
Tell, Joseph M., 4,554,761, Cl. 47-1.410.
Carrier Corporation: *See—*
Haas, Rudy E., 4,554,968, Cl. 165-144.000.
Carter, Carlos R. Apparatus for coating and cutting sheet material. 4,554,886, Cl. 118-42.000.
Carter, Eric L.; and Ward, Harold T., to International Business Machines Corporation. Circuit apparatus for generating modulus-N residues. 4,555,769, Cl. 364-746.000.
Carter, Frank D. Scuba tank positioner. 4,555,083, Cl. 248-313.000.
Carter, Garry L.; and Weeks, Vaughan B., to Medical Engineering Corporation. Toilet mounted urine flow meter. 4,554,687, Cl. 4-144.200.
Cartwright, David, to Imperial Chemical Industries, plc. Process for preparing 2,3-dichloro-5-trichloromethylpyridine. 4,555,575, Cl. 546-345.000.
Carty, Michael W.; and Kraus, Guenther M., to Combustion Engineering, Inc. Method of manufacturing a wear resistant pipe. 4,554,721, Cl. 29-416.000.
Cascini, Michael R.: *See—*
Mosier, Donald E.; and Cascini, Michael R., 4,555,625, Cl. 250-231.0SE.
Case, William R.; and Johnson, Wildey E., to International Business Machines Corporation. Method and apparatus for measuring thickness of epitaxial layer by infrared reflectance. 4,555,767, Cl. 364-563.000.
Casilli, Joseph C., to International Telephone and Telegraph Corporation. Air-operated diaphragm pump and a valve arrangement therefor. 4,555,222, Cl. 417-393.000.
Casket Shells, Inc.: *See—*
Semon, Joseph R., 4,555,119, Cl. 277-207.00R.
Cassidenti, Michael L., to Rockwell International Corporation. Metalworking tools with augmented conductivity. 4,555,204, Cl. 408-144.000.
Castegnier, Adrien, to Elcorsy Inc. Image reproduction by in plane electro-coagulation of a colloid. 4,555,320, Cl. 204-180.900.
Caterpillar Tractor Co.: *See—*
Garman, James A., 4,554,720, Cl. 29-402.010.
Gibson, Dennis H.; Stockner, Alan R.; and Waldman, Donald J., 4,554,901, Cl. 123-450.000.
Caveney, Jack E., to Panduit Corp. Termination tooling for applying connectors to flat cable. 4,554,733, Cl. 29-749.000.
Cebal: *See—*
Houdayer, Bernard; Le Fur, Bernard; Meneghin, Rene ; and Moniod, Jean-Michel, 4,555,208, Cl. 413-2.000.
Celotex Corporation, The: *See—*
Frentzel, Richard L., 4,555,442, Cl. 428-318.400.
Snider, Scott C.; and DeLeon, Alberto, 4,555,418, Cl. 427-373.000.
Cerberus AG: *See—*
Muggli, Jurg; Guttinger, Heinz; and Horvath, Zoltan, 4,555,634, Cl. 250-565.000.
Cerwin, Robert J.: *See—*
Aday, Jorge L.; and Cerwin, Robert J., 4,555,016, Cl. 206-63.300.
Cescon, Lawrence A.; and Millet, Nolan J., Jr., to Du Pont de Nemours, E. I., and Company. Stable nitrate/emulsion explosives and emulsion for use therein. 4,555,278, Cl. 149-21.000.
Cetus Corporation: *See—*
Bahl, Chander P.; and Nunberg, Jack, 4,555,486, Cl. 435-91.000.
Hewett, Gary E.; Atwood, Brian G.; and Wennberg, Timothy J., 4,554,839, Cl. 73-864.160.
Chabal, Joseph, to PPG Industries, Inc. Apparatus for differentially stretching, aligning and cutting sheet material. 4,554,713, Cl. 26-51.000.
Chain Supply Company: *See—*
Krempa, James F., 4,555,014, Cl. 198-852.000.
Champion Spark Plug Company: *See—*
Weinstein, Richard; Davis, James W.; and Campbell, Robert K., 4,555,058, Cl. 239-223.000.
Chan, Keng S.: *See—*
Kalpakci, Bayram; and Chan, Keng S., 4,554,974, Cl. 166-273.000.
Chance, Dudley A.; Reiley, Timothy C.; and Sampogna, Michael, to International Business Machines Corporation. Forming patterns in metallic or ceramic substrates. 4,555,285, Cl. 156-89.000.
Chang, Shih-Chieh. Architectural construction and equipment for concrete. 4,555,088, Cl. 249-192.000.
Chartrain, Armand N.; and Genne, Lee A. Battery post connector. 4,555,159, Cl. 339-239.000.
Chaudhuri, Asit R.: *See—*
Ekdahl, Wendell G.; Chaudhuri, Asit R.; and Miiller, William C., 4,555,492, Cl. 501-38.000.
Chazal, Guy A.; and Bodet, Jean A., to Societe Parisienne d'Impression et de Cartonnage. Process of making folded cardboard container covered by a layer of synthetic material and provided with a peripheral frame. 4,555,381, Cl. 264-516.000.
Cheeseman, Edward W.: *See—*
von Lersner, Wolf A.; Cheeseman, Edward W.; Simpson, Thomas K.; and Weaver, George R., 4,554,955, Cl. 141-1.000.
Chemical Fabrics Corporation: *See—*
Effenberger, John A.; and Keese, Frank M., 4,555,543, Cl. 524-520.000.
Chemische Fabrik Stockhausen GmbH: *See—*
Landscheidt, Alfons, 4,555,581, Cl. 549-463.000.
Chemische Werke Huels, A.G.: *See—*
Droescher, Michael; Mumcu, Salih; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, 4,555,550, Cl. 525-424.000.
Chen, Evan N., to Warner-Lambert Company. One-piece disposable razor. 4,554,735, Cl. 30-47.000.
Chen, Evan N.: *See—*
Byrne, David S.; and Chen, Evan N., 4,555,030, Cl. 211-49.100.
Cheresnowsky, Michael J., to GTE Products Corporation. Process for purifying molybdenum trioxide. 4,555,386, Cl. 423-54.000.
Chesebrough-Pond's, Inc.: *See—*
Engle, Elbert, 4,555,102, Cl. 271-4.000.
Chevron Research Company: *See—*
Roberts, F. Alex, 4,555,779, Cl. 367-19.000.
Chicopee: *See—*
Mays, Alfred T., 4,555,430, Cl. 428-134.000.
Chida, Takeshi: *See—*
Ueda, Akio; Akita, Shuichi; and Chida, Takeshi, 4,555,548, Cl. 525-237.000.
Chikatani, Hajime, to Kabushiki Kaisha Daisei Kikai. Package bag binding apparatus. 4,554,776, Cl. 53-76.000.
Chisso Corporation: *See—*
Oda, Yoshifumi, 4,555,398, Cl. 424-19.000.
Chitil, Manfred, to Klockner CRA Technologie GmbH. Process for making fuel from solid metallic iron-bearing materials. 4,555,267, Cl. 75-46.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Asaoka, Sachio; and Sendo, Takashi, 4,555,394, Cl. 423-626.000.
Cho, Hideyuki. Moving web expanding and guiding apparatus. 4,554,714, Cl. 26-75.000.
Cho, Hyon M. Portable folder type pencil case. 4,555,018, Cl. 206-214.000.
Christman, Donald L., to BASF Wyandotte Corporation. Rigid polyurethane foams employing alkylene oxide adducts of alkanolamines. 4,555,531, Cl. 521-167.000.
Chrysler Corporation: *See—*
Atkins, Walter J., 4,554,902, Cl. 123-557.000.

Chu, Nan S.: *See*—
Rosen, Meyer R.; Fan, You-Ling; and Chu, Nan S., 4,555,346, Cl. 210-734.000.
Ciba Geigy Corporation: *See*—
Boger, Manfred; and Drabek, Jozef, 4,555,405, Cl. 514-488.000.
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., 4,555,541, Cl. 524-180.000.
Thummel, Rudolph C.; and Fory, Werner, 4,555,262, Cl. 71-92.000.
Zink, Rudolf; and Fletcher, Ian J., 4,555,569, Cl. 544-105.000.
Cincinnati Milacron Inc.: *See*—
Ackley, Harry E., 4,555,047, Cl. 222-192.000.
Wood, David B., III, 4,554,842, Cl. 74-409.000.
Citron, Alan L.; Lindquist, Thomas W. F.; and Popp, William E., to Bancware, Inc. Data-entry system. 4,555,699, Cl. 340-707.000.
Claney, Robert L.; Walton, Herbert H.; Kehoe, Steven D.; and Barron, Kimball R., to Fisher Controls International, Inc. Single disc rotary valve. 4,554,943, Cl. 137-242.000.
Clarion Co., Ltd.: *See*—
Nara, Hirotoshi, 4,555,080, Cl. 248-27.100.
Clark, Benton C., III: *See*—
Thornton, Michael G.; and Clark, Benton C., III, 4,555,331, Cl. 210-99.000.
Clark, Frederick; and Moore, Colin, to British Aerospace Public Limited Company. Detecting machine tool set-up errors. 4,555,698, Cl. 340-680.000.
Clarke, David E.; Davies, James F.; Smart, Colin; and Tune, John B., to Lever Brothers Company. Detergents products. 4,555,354, Cl. 252-90.000.
Clemens Gerhards Holzwarenfabrik KG: *See*—
Gerhards, Ludwig, 4,555,034, Cl. 215-100.00R.
Close, J. Garth. Thin-profile copy holder. 4,554,753, Cl. 40-341.000.
Clouthier, Richard S.; and Rogers, Thomas A., to Schlegel Corporation. Conductive charge/discharge device. 4,555,171, Cl. 355-3.0CH.
Cloyd, Richard A.: *See*—
Smyly, Harold M.; Miller, Charles D.; Cloyd, Richard A.; and Heller, Clarence, 4,554,905, Cl. 124-56.000.
Cobb, Jasper E., III, to Armco Research and Technology. Load recall valve. 4,554,947, Cl. 137-596.180.
Cobb, William O. Tubing anchor assembly. 4,554,971, Cl. 166-88.000.
Coca-Cola Company, The: *See*—
Rodth, Joseph J.; Smith, Ira A., Jr.; and Cornett, Donald F., 4,555,045, Cl. 222-1.000.
Coenen, Rolf: *See*—
Leifeld, Ferdinand; Coenen, Rolf; Oelering, Werner; and Klopp, Ludwig, 4,554,708, Cl. 19-80.00R.
Cohen, Joseph D., to Performance Pool Products, Ltd. Method and apparatus for cleaning a purgible swimming pool strainer. 4,555,334, Cl. 210-169.000.
Cohen, Saul M.; and LeBlanc, John R., to Monsanto Company. Radiation-curable compositions comprising isocyanuric acid-acrolein derivatives. 4,555,319, Cl. 204-159.210.
Cohn, David B.; and Conley, Eugene E., to Northrop Corporation. Gas laser preionization device. 4,555,787, Cl. 372-86.000.
Cole, Tyler L., to Stedman Corporation. Multi-layer unitized fabric construction and method of making same. 4,555,428, Cl. 428-102.000.
Coleco Industries, Inc.: *See*—
Sands, Howard E., 4,555,423, Cl. 428-79.000.
Coleman, Gerald E. Severing apparatus for a loom. 4,554,952, Cl. 139-302.000.
Coleman, William M., III; and Edmondson, Morris S., to Dow Chemical Company, The. Titanium complexes and catalysts prepared therefrom. 4,555,497, Cl. 502-115.000.
Collier, Richard B. Chlorination device. 4,555,323, Cl. 204-258.000.
Collins, C. Neal; and Peter, Joseph E., to Vortec Corporation. Flow-amplifying liquid-atomizing nozzle. 4,555,059, Cl. 239-425.000.
Collins, David A.; Lile, Derek L.; and Zeisse, Carl R., to United States of America, Navy. Furnace transient anneal process. 4,555,273, Cl. 148-1.500.
Collins, Michael F.; and Lordi, Francis D., to General Electric Co. Plasma jet cleaning apparatus and method. 4,555,612, Cl. 219-121.00P.
Comato B.V.: *See*—
Pondes, Alfonsius A. T., 4,555,202, Cl. 407-117.000.
Combourieu, Michel; Simond, Jacques A. L.; and Monteil, Andre J., to Riom Laboratoires C.E.R.M. "RL-CERM" S.A. 3-Alkoxy-2-(N-pyrolidino)-N-pyridyl-N-furyl(or thienyl) methyl-pyropyl amines useful as calcium antagonists. 4,555,514, Cl. 514-343.000.
Combustion Engineering, Inc.: *See*—
Carty, Michael W.; and Kraus, Guenther M., 4,554,721, Cl. 29-416.000.
Francis, Alex W., Jr., 4,555,332, Cl. 210-104.000.
Comm Stitch: *See*—
Armbruster, Thomas L., 4,555,245, Cl. 604-396.000.
Commissariat a l'Energie Atomique: *See*—
Bonnet, Bernard; Bressy, Roger; and Sevaille, Jean-Claude, . 4,555,640, Cl. 307-115.000.
David, Bernard; and Pigeon, Michel, 4,555,664, Cl. 324-225.000.
Communication Architecture and Building Research Corporation: *See*—
Orikasa, Wataru; Tochimoto, Kunio; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; and Saito, Hiroshi, 4,555,286, Cl. 156-94.000.
Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.
Compagnie Electro-Mecanique: *See*—
Hennevin, Bernard, 4,555,754, Cl. 363-132.000.
Compagnie Europeenne d'Accumulateurs, S.A.: *See*—
Mirebeau, Pierre; and Gindre, Jean, 4,555,458, Cl. 429-203.000.
Compagnie Generale des Etablissments Michelin: *See*—
Pompier, Jean-Pierre, 4,554,960, Cl. 152-450.000.
Compagnie Industrielle de Mechanismes: *See*—
Dauvergne, Jean, 4,554,763, Cl. 49-349.000.
Conley, Eugene E.: *See*—
Cohn, David B.; and Conley, Eugene E., 4,555,787, Cl. 372-86.000.
Conley, John L. Device and method for securing overlapping corrugated sheets. 4,554,773, Cl. 52-521.000.
Conlin Bros., Inc.: *See*—
Kirkland, Alvin E., 4,554,681, Cl. 2-2.000.
Connelly, Lawrence J.: *See*—
Sykes, Robert C.; Connelly, Lawrence J.; and Roe, William J., 4,555,329, Cl. 209-5.000.
Connelly, Will A. Television pulsed navigation system. 4,555,707, Cl. 343-387.000.
Connolly, James D. Method of making centrifuge screen baskets. 4,555,055, Cl. 228-155.000.
Conoco Inc.: *See*—
Coon, Julian B.; and Petry, Eston F., 4,554,941, Cl. 137-240.000.
Conrad, Lucas J.; and White, Jackie L., to R. J. Reynolds Tobacco Company. Pressure vessel and method of using same. 4,554,932, Cl. 131-296.000.
Consolidated Foods Corporation: *See*—
Ostrander, Charles, 4,554,749, Cl. 36-102.000.
Conti, Vincent N., to American Safety Closure Corp. Pilfer-proof cap. 4,555,039, Cl. 215-252.000.
Convis, Danny B.; Crehan, Donald T.; and Lovell, Charles J., to International Business Machines Corp. Internal image and bit array for display and printing of graphics. 4,555,700, Cl. 340-721.000.
Coombs, William F.: *See*—
Kunzler, Wilhelm F.; and Coombs, William F., 4,555,372, Cl. 264-2.100.
Coon, Julian B.; and Petry, Eston F., to Conoco Inc. Fluid vibration apparatus. 4,554,941, Cl. 137-240.000.
Cope, Andrew P.: *See*—
Angelucci, Richard J.; Cope, Andrew P.; Hallam, Donald E.; and Ladd, Harry E., 4,555,067, Cl. 242-35.50A.
Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Phenolic modified urethane elastomer. 4,555,552, Cl. 525-456.000.
Cornett, Donald F.: *See*—
Rodth, Joseph J.; Smith, Ira A., Jr.; and Cornett, Donald F., 4,555,045, Cl. 222-1.000.
Corney, Andrew C.: *See*—
Sealey, Graham P.; and Corney, Andrew C., 4,554,831, Cl. 73-304.00R.
Cosden Technology, Inc.: *See*—
Morris, Jeffrey D.; and Fuller, Robert A., 4,555,384, Cl. 422-109.000.
Cottevieille, Christian: *See*—
Bonicel, Jean-Pierre; Prigent, Madeleine; and Cottevieille, Christian, 4,555,539, Cl. 524-127.000.
Cousens, Donald E.: *See*—
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,555,052, Cl. 228-1C4.000.
Cousin, Michel: *See*—
Meyer, Nicolas; and Cousin, Michel, 4,555,544, Cl. 524-595.000.
Covault, Mike L.: *See*—
Jackson, Bruce J.; Simmons, Ralph F.; and Covault, Mike L., 4,555,740, Cl. 360-113.000.
Coy, Calvin L.; and O'Neal, Keith T., to Canron Corp. Ballast brooms. 4,554,697, Cl. 15-55.000.
Craig, Richard H.: *See*—
Anderson, Carl; and Craig, Richard H., 4,555,459, Cl. 429-211.000.
Crehan, Donald T.: *See*—
Convis, Danny B.; Crehan, Donald T.; and Lovell, Charles J., 4,555,700, Cl. 340-721.000.
Cressey, John R.; and Meneely, Dennis C., to Rixon, Inc. Synchronous digital QPSK demodulator with carrier error correction. 4,555,567, Cl. 329-50.000.
Crook, Robert L., to Albany International Corp. Multilayered press felt. 4,555,440, Cl. 428-223.000.
Crooke, Arthur W.; and Stebbins, Edwin E., to Analogic Corporation. Multi-mode oscilloscope trigger with compensating trigger delay. 4,555,765, Cl. 364-571.000.
Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. N-Benzylimidazoles as selective inhibitors of the thromboxane synthetase enzyme. 4,555,516, Cl. 514-326.000.
Crossfield Electronic Limited: *See*—
Gamson, Alan R.; and Kellner, Phillip R., 4,555,475, Cl. 430-309.000.
Cselt Centro Studi e Laboratori Telecomunicazioni SpA: *See*—
Alaria, Gian B.; Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,555,782, Cl. 370-104.000.
Curiel, Jesus V., to Vitro Tec Fideicomiso. Pressing machine for the manufacture of glass articles. 4,555,258, Cl. 65-319.000.
Cussler, Edward L., to University of Minnesota, Regents of the. Method of size-selective extraction from solutions. 4,555,344, Cl. 210-670.000.
Cusumano, Salvatore V.; and Glassman, Aaron, to P.S.R., Incorporated. Alignment system for a garment accessory-holding jig. 4,554,877, Cl. 112-105.000.

CX Packaging Inc.: *See*—
Hubert, Claudette, 4,554,919, Cl. 128-360.000.

Cyran, Michael J.; and Wang, Kuei-Hsiung, to Intermountain Research & Development Corporation. Dry injection flue gas desulfurization process. 4,555,391, Cl. 423-244.000.

Daghe, Joseph L.; Humes, Dennis W.; and Stanley, Mervin D., to Mueller Co. Operating wrench for tamperproof hydrants. 4,554,944, Cl. 137-296.000.

Dagiel, Richard T.: *See*—
Harrington, Richard F.; Dagiel, Richard T.; and Brown, Villy, 4,555,007, Cl. 192-98.000.

Dahl, Richard E.; Faflak, Daniel P.; and Sendelbach, Lee A., to International Business Machines Corporation. Legibility enhancement for alphanumeric displays. 4,555,701, Cl. 340-736.000.

Dahme, Jerome R., to Decision Data Computer Corp. Method and apparatus for storage and accessing of characters, and electronic printer employing same. 4,555,763, Cl. 364-521.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Maki, Hirohisa; Sano, Takashi; and Yamamoto, Misao, 4,555,536, Cl. 524-66.000.

Dai-Ichi Seiko Co., Ltd.: *See*—
Maruyama, Ryozi, 4,555,685, Cl. 335-303.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,555,427, Cl. 428-195.000.
Nozaka, Yoshiki, 4,555,288, Cl. 156-191.000.

Daicel Chemical Industries, Co., Ltd.: *See*—
Arita, Koichiro; and Suzuki, Hajime, 4,555,566, Cl. 528-323.000.

Daicel Chemical Industries, Ltd.: *See*—
Yano, Takashi; and Asami, Masahiro, 4,555,468, Cl. 430-160.000.
Yuki, Heimei; and Okamoto, Yoshio, 4,555,574, Cl. 546-342.000.

Daido Sanso K. K.: *See*—
Wakui, Tadahiro; and Handa, Tadahiko, 4,555,526, Cl. 518-717.000.

Daigneault, Steven M.: *See*—
Aldrich, Ralph E.; and Daigneault, Steven M., 4,555,162, Cl. 350-162.170.

Daiichi Dentsu, K.K.: *See*—
Doniwa, Tabito, 4,554,980, Cl. 173-12.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Masuda, Tatsunosuke; Hohki, Tetsuo; and Kurusu, Yasuo, 4,555,180, Cl. 356-445.000.

Dalsin, Bernard L., to Bernard Dalsin Manufacturing Company. Chimney damper. 4,554,863, Cl. 98-59.000.

D'Amour, Richard; and D'Amour, Ronald. Bottle cooling device. 4,554,798, Cl. 62-457.000.

D'Amour, Ronald: *See*—
D'Amour, Richard; and D'Amour, Ronald, 4,554,798, Cl. 62-457.000.

Danby, Hal C.; and Ritson, Carl, to Anatros Corporation. Reflective optical fluid pressure sensor. 4,554,837, Cl. 73-705.000.

Danfoss A/S: *See*—
Johansson, Gustav A., 4,554,791, Cl. 62-55.000.

Danielsen, Donald P.; and Lively, Lewell M., Jr., to McDonnell Douglas Corporation. Container restraint release. 4,555,133, Cl. 294-82.240.

Danish, Adel: *See*—
Danish, Sherif; and Danish, Adel, 4,555,693, Cl. 340-365.00S.

Danish, Sherif; and Danish, Adel, to Polytel Corp. Multikey keyboard for inputting data into a computer. 4,555,693, Cl. 340-365.00S.

Dappen, Glen M.: *See*—
LaRossa, Denise D.; Thunberg, Allen L.; Norton, Gary E.; and Dappen, Glen M., 4,555,484, Cl. 435-21.000.

Data Card Corporation: *See*—
Polad, Michael D.; Gerlach, LeRoy E.; and Schmidt, Robert H., 4,555,610, Cl. 219-121.0LA.

Daugherty, Robert O. Patient lifting apparatus. 4,554,691, Cl. 5-81.00R.

Dauvergne, Jean, to Compagnie Industrielle de Mechanismes. Electric glass-raising device for a motor vehicle. 4,554,763, Cl. 49-349.000.

Davenport, John M.: *See*—
Leskovec, Robert A.; Davenport, John M.; and von Herrmann, Pieter J., 4,555,647, Cl. 315-179.000.

David, Bernard; and Pigeon, Michel, to Commissariat a l'Energie Atomique. Process and device for inspecting a surface in simulated manner which differs from the real surface scanning by an eddy current transducer. 4,555,664, Cl. 324-225.000.

Davids, Martin: *See*—
Baldry, Kenneth; and Davids, Martin, 4,555,781, Cl. 370-60.000.

Davies, David L., to Hughes Tool Company. Tubing pressurized firing apparatus for a tubing conveyed perforating gun. 4,554,981, Cl. 175-4.520.

Davies, James F.: *See*—
Clarke, David E.; Davies, James F.; Smart, Colin; and Tune, John B., 4,555,354, Cl. 252-90.000.

Davis, Eugene E., to Johnsen & Jorgensen (Plastics) Limited. Container closure with tunnel member. 4,555,035, Cl. 215-215.000.

Davis, James W.: *See*—
Weinstein, Richard; Davis, James W.; and Campbell, Robert K., 4,555,058, Cl. 239-223.000.

Davlin, Irwin H. Adapter union and improved adapter member therefor. 4,555,129, Cl. 285-3.000.

Dayco Corporation: *See*—
Miranti, Joseph P., Jr., 4,555,239, Cl. 474-93.000.
Orsak, John E.; and Roman, Charles A., 4,555,438, Cl. 428-219.000.

de la Mettrie, Roland; and Canivet, Patrick, to L'Oreal. Hair-dyeing compositions based on nitro direct dyestuffs, and a dyeing process using these compositions. 4,555,247, Cl. 8-405.000.

de Nederlandsche Bank N.V.: *See*—
Klumper, Jan W.; and Visser, Huibert, 4,555,181, Cl. 356-448.000.

Debuisser, Jean-Claude A.: *See*—
Bossennec, Jean-Louis G.; Debuisser, Jean-Claude A.; and Farhi, Philippe F., 4,555,705, Cl. 343-55.00A.

De Caro, Robert E.: *See*—
Bridgewater, Walter F.; De Caro, Robert E.; Larson, Roger; and Wall, Llewellyn E., 4,555,623, Cl. 250-214.00A.

Decision Data Computer Corp.: *See*—
Dahme, Jerome R., 4,555,763, Cl. 364-521.000.

Deckman, Harry W.; Witzke, Horst; Wronski, Christopher; and Yablonovitch, Eli, to Exxon Research & Engineering Company. Method for making optically enhanced thin film photovoltaic device using lithography defined random surfaces. 4,554,727, Cl. 29-572.000.

Decko, Del P.: *See*—
Klammer, Mark S.; and Decko, Del P., 4,555,233, Cl. 440-56.000.

DeFilippis, Stanley J.: *See*—
Everett, Leroy J.; and DeFilippis, Stanley J., 4,555,629, Cl. 250-362.000.

De Garmo, Billy B. Tanning wand. 4,555,196, Cl. 401-220.000.

Deinzer, Gerald J., to Teleconferencing Systems International, Inc. Wireless hands-free conference telephone system. 4,555,592, Cl. 179-2.00E.

DeLeon, Alberto: *See*—
Snider, Scott C.; and DeLeon, Alberto, 4,555,418, Cl. 427-373.000.

Delor, Michel; and Bruyere, Michel, to Framatome & Cie. Method of protection of a pressurized-water nuclear reactor. 4,555,382, Cl. 376-216.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; Lee, Seok H.; and Phelps, Mary E., to Wisconsin Alumni Research Foundation. Method for preparing 1-hydroxyvitamin D compounds. 4,555,364, Cl. 260-397.200.

DenBoer, William: *See*—
Guha, Subhendu; and DenBoer, William, 4,555,586, Cl. 136-259.000.

Denk, Josef; Dietrich, Walter; and Weller, Otto, to Robert Bosch GmbH. Convertible-format packaging machine. 4,554,777, Cl. 53-201.000.

Dennison Manufacturing Co.: *See*—
Geurtsen, Friedrich H. H.; Anemaet, John M.; Smith, Donald R.; and Boyd, Mary G., 4,555,436, Cl. 428-200.000.

Derringer, Gene R., to Monarch Marking Systems, Inc. Fastener assembly and mold for making same. 4,554,711, Cl. 24-150.0FP.

Derrington, Tommy J., to Eagle-Picher Industries, Inc. Method for removing gun barrel evacuator. 4,554,722, Cl. 29-426.500.

DeSantis, Ercele A. Open end ratchet wrench. 4,554,847, Cl. 81-111.000.

Desch, Steven M.: *See*—
Williams, Todd E.; and Desch, Steven M., 4,554,942, Cl. 137-240.000.

Designs for Vision, Inc.: *See*—
Feinbloom, William, 4,555,164, Cl. 350-420.000.

Desjardins, Conrad D.: *See*—
Buckley, Leo P.; Burrill, Kenneth A.; Desjardins, Conrad D.; and Salter, Robert S., 4,555,361, Cl. 252-626.000.

Destefanis, Paolo: *See*—
Alaria, Gian B.; Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,555,782, Cl. 370-104.000.

Deutz-Allis Corporation: *See*—
Geiersbach, Allois F.; and Murray, David L., 4,555,725, Cl. 358-93.000.

Devecchi, Daniele; and Torelli, Guido, to SGS-ATES Componenti Elettronici SpA. Output interface for a three-state logic circuit in an integrated circuit using MOS transistors. 4,555,644, Cl. 307-482.000.

Devlin, Barry R. J., to Shell Oil Company. Method for sterilizing male parts of plants. 4,555,260, Cl. 71-88.000.

deVreeze, Joop J.; Tijssen, Zwier; and Doorley, Daniel, to Multigood, b.v. Painting tool. 4,555,195, Cl. 401-218.000.

de Willigen, Hans C.; and Kokken, Johannes E., to U.S. Philips Corporation. Rectilinear guide comprising first and second members which are movable one within the other. 4,555,148, Cl. 308-6.00R.

Dexheimer, Edward M.: *See*—
Camp, Ronald L.; Dexheimer, Edward M.; and Anchor, Michael J., 4,555,549, Cl. 525-409.000.

Dhanji, Shiraz A., to ACR Electronics Inc. Battery cell containing potassium monoperoxysulfate in the cathode mix. 4,555,457, Cl. 429-199.000.

DiBiase, Robert: *See*—
Galani, Zvi; Laton, Richard W.; Waterman, Raymond C., Jr.; and DiBiase, Robert, 4,555,678, Cl. 331-1.00A.

Dick, George: *See*—
Arway, George; Eremity, Frank; Dick, George; and Pullen, Elaine, 4,555,712, Cl. 346-75.000.

Dick Martin Design Ltd.: *See*—
Martin, Richard A.; and Bialobrzeski, Walter, 4,555,378, Cl. 264-292.000.
Martin, Richard A., 4,555,429, Cl. 428-131.000.

Dick, Richard J.: *See*—
Rodgers, Stephen D.; Dick, Richard J.; and McGinnis, Vincent D., 4,555,366, Cl. 260-404.800.

DICKEY-john Corporation: *See*—
Steffen, David E., 4,555,624, Cl. 250-223.00R.

Dickhart, William W., III; Graziani, Dante J., Jr.; Herring, James M., Jr.; Pavlick, Michael J.; and Renn, Edward J., to Budd Company, The. Isolator for a spring in a railway car. 4,555,095, Cl. 267-4.000.

Dickinson, Roger P.: *See—*
Cross, Peter E.; and Dickinson, Roger P., 4,555,516, Cl. 514-326.000.

Didier-Werke AG: *See—*
Schiefer, Bernhard; and Bumberger, Herbert, 4,555,050, Cl. 222-597.000.

Diehl, GmbH & Co.: *See—*
Schleicher, Ulrich, 4,554,872, Cl. 102-490.000.

Dier, Stephen A., to TRW Inc. Valve sleeve shaping method. 4,554,817, Cl. 72-370.000.

Dietrich, Walter: *See—*
Denk, Josef; Dietrich, Walter; and Weller, Otto, 4,554,777, Cl. 53-201.000.

Dietzsch, Gunter: *See—*
Nitschmann, Karl; Dolata, Hans; and Dietzsch, Gunter, 4,554,853, Cl. 83-522.000.

Dijkmans, Eise C.: *See—*
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,555,676, Cl. 330-298.000.

Dillon, Benny N. Self-aligning scale assembly and method. 4,554,987, Cl. 177-134.000.

Dirnberger, Linus R.: *See—*
Brick, Michael J.; and Dirnberger, Linus R., 4,555,689, Cl. 340-19.00R.

Distin, Robert G., Jr.; Lang, Thomas J.; and Smith, David E., to Advanced Energy Concept "81 Ltd. Two-piece retainer for epicyclic transmissions. 4,554,846, Cl. 74-805.000.

Ditscheid, Hans L., to U.S. Philips Corporation. Device for injection moulding insulating disks onto the inner conductor of high-frequency coaxial cables. 4,555,227, Cl. 425-122.000.

Ditto, Joseph R. Friction locking hand clamp. 4,555,100, Cl. 269-166.000.

Dixon, Alan G., to Automotive Products plc. Friction clutches. 4,555,005, Cl. 192-70.270.

Dr. Johannes Heidenhain GmbH: *See—*
Affa, Alfred, 4,554,741, Cl. 33-125.00C.

Doering, Howard W., Jr.: *See—*
Sheets, Ronald E.; Barbas, George A.; Doering, Howard W., Jr.; and Bjorkman, John R., 4,555,630, Cl. 250-492.100.

Dohi, Nobuyasu: *See—*
Obata, Keigo; Dohi, Nobuyasu; Okuhama, Yoshiaki; Masaki, Seishi; Okada, Yukiyoshi; and Yoshida, Tadashi, 4,555,314, Cl. 204-44.400.

Dolata, Hans: *See—*
Nitschmann, Karl; Dolata, Hans; and Dietzsch, Gunter, 4,554,853, Cl. 83-522.000.

Dolejs, Anthony H., to ARDAC, Inc. Door latch mechanism. 4,554,807, Cl. 70-208.000.

Doll, Friedhelm, to Turbo-Werk Messtechnik GmbH. Measuring device for the magneto-inductive measuring of the flow rate of a liquid medium. 4,554,828, Cl. 73-202.000.

Dolorgiet GmbH & Co KG: *See—*
Gruber, Klaus; Lohner, Manfred; Posselt, Klaus; and Wagener, Hans H., 4,555,524, Cl. 514-570.000.

Dombkowski, Otto: *See—*
Voss, Jurgen; Dombkowski, Otto; Kudlich, Walter; and Stodulka, Jan, 4,555,024, Cl. 206-454.000.

Dominick, Thomas S.; and Anderson, Roy G., to Westinghouse Electric Corp. Improved, low-distortion, broadband directional coupler formed by multiple series transformers. 4,555,681, Cl. 333-112.000.

Doniwa, Tabito, to Daiichi Dentsu, K.K. Nut runner using induction motor. 4,554,980, Cl. 173-12.000.

Donkin, Charles W., to Burroughs Corporation. Winchester disc drive. 4,555,189, Cl. 384-493.000.

Doorley, Daniel: *See—*
deVreeze, Joop J.; Tijssen, Zwier; and Doorley, Daniel, 4,555,195, Cl. 401-218.000.

Dorman, William J., to Westinghouse Electric Corp. Interface system for hybrid control loops. 4,555,757, Cl. 364-165.000.

Dornier GmbH: *See—*
Roth, Siegfried; and Stenzenberger, Horst, 4,555,426, Cl. 428-113.000.

Doutre, Don A.; and Guthrie, Roderick I. L., to Limca Research Inc. Method and apparatus for the detection and measurement of particulates in molten metal. 4,555,662, Cl. 324-71.400.

Dow Chemical Company, The: *See—*
Coleman, William M., III; and Edmondson, Morris S., 4,555,497, Cl. 502-115.000.
Hefner, Robert E., Jr., 4,555,553, Cl. 525-523.000.
Hefner, Robert E., Jr., 4,555,554, Cl. 525-531.000.
Hefner, Robert E., Jr.; and White, Mary N., 4,555,563, Cl. 528-96.000.

Dow Corning Corporation: *See—*
Lee, Chi-Long; Maxson, Myron T.; and Rabe, James A., 4,555,529, Cl. 521-124.000.

Dozier, William. Table game puck. 4,555,114, Cl. 273-128.00R.

Drabek, Jozef: *See—*
Boger, Manfred; and Drabek, Jozef, 4,555,405, Cl. 514-488.000.

Draft Systems, Inc.: *See—*
Smith, Terry W.; and Fallon, Timothy R., 4,554,864, Cl. 99-340.000.

Dragerwerk Aktiengesellschaft: *See—*
Eckstein, Wolfgang, 4,555,252, Cl. 55-132.000.

Drake, Gerald E., to Minnesota Mining and Manufacturing Company. Bioelectrode connector. 4,555,155, Cl. 339-61.00R.

Dranger, Jan. Furniture construction. 4,555,136, Cl. 297-108.000.

Dresser Industries, Inc.: *See—*
Foley, Robert W.; Storck, Robert C.; Mickus, Donald J., deceased; and Pastors, Debbie, executrix, 4,554,979, Cl. 172-813.000.
Scruggs, David M., 4,555,186, Cl. 384-93.000.

Driessen, Leonardus M. H. E., to U.S. Philips Corporation. System for transmitting television picture information using an error-protection code. 4,555,729, Cl. 358-133.000.

Droescher, Michael; Mumcu, Salih; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, to Chemische Werke Huels, A.G. Molding compositions based on high molecular weight polyether ester amides. 4,555,550, Cl. 525-424.000.

Dryden, Hugh L., Jr; and Hill, John B., to G. D. Searle & Co. Method and intermediates for producing α-L-aspartyl-L-phenylalanine. 4,555,362, Cl. 260-112.50R.

DuBois, Chester G., to Outboard Marine Corporation. Fluid pumping device for use with a fluid pump. 4,555,221, Cl. 417-349.000.

Duchane, David V.; and Barthell, Barry L., to United States of America, Energy. Method of forming a continuous polymeric skin on a cellular foam material. 4,555,313, Cl. 204-3.000.

Dueber, Thomas E.; and Nebe, William J., to Du Pont de Nemours, E. I., and Company. Alkali developable photopolymer crystalline composition. 4,555,473, Cl. 430-281.000.

Dufour, Mark D.: *See—*
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,555,052, Cl. 228-104.000.

Dunaevsky, Leonid M.: *See—*
Vasiliev, Leonard L.; Kiselev, Vladimir G.; Morgun, Valery A.; Marchenko, Anatoly M.; Rudnev, Evgeny A.; Nesvit, Vasily A.; Dunaevsky, Leonid M.; Tverdokhleb, Nikolai F.; Bogdanov, Vladimir M.; and Rabetsky, Mikhail I., 4,554,966, Cl. 165-104.210.

Du Pont de Nemours, E. I., and Company: *See—*
Angelucci, Richard J.; Cope, Andrew P.; Hallam, Donald E.; and Ladd, Harry E., 4,555,067, Cl. 242-35.50A.
Bednarek, Milan B.; and Houze, Eric C., 4,555,535, Cl. 524-40.000.
Beresniewicz, Aleksander, 4,555,556, Cl. 526-212.000.
Cescon, Lawrence A.; and Millet, Nolan J., Jr., 4,555,278, Cl. 149-21.000.
Dueber, Thomas E.; and Nebe, William J., 4,555,473, Cl. 430-281.000.
Loomis, Gary L., 4,555,528, Cl. 521-89.000.
Nunn, Gary F., 4,554,716, Cl. 28-263.000.
Petersen, Wallace C., 4,555,261, Cl. 71-90.000.

DuPont, John P., to RTE Corporation. Heat transfer device for electrical connector in insulating housing of high voltage splice or terminator. 4,555,588, Cl. 174-73.00R.

Durand, Charles A.: *See—*
Platter, Sanford; Durand, Charles A.; and Gadsby, Larry R., 4,555,077, Cl. 242-198.000.

Durham, Robert L., to Agritec, Inc. Biogenetic silica insulation. 4,555,448, Cl. 428-402.000.

Duryee, Peter S.: *See—*
Eng, Benjamin, Jr.; Duryee, Peter S.; and Anholm, John M., Jr., 4,555,692, Cl. 340-347.0AD.

Dyke, David E.: *See—*
Adams, Kenneth J.; and Dyke, David E., 4,555,294, Cl. 156-309.600.

Dynacast International Limited: *See—*
Wright, David E., 4,554,962, Cl. 164-132.000.

E. R. Squibb & Sons, Inc.: *See—*
Hall, Steven E.; and Haslanger, Martin F., 4,555,523, Cl. 514-469.000.
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,555,506, Cl. 514-91.000.
Misra, Raj N.; and Karanewsky, Donald S., 4,555,520, Cl. 514-346.000.
Rovnyak, George C., 4,555,579, Cl. 548-409.000.

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Derrington, Tommy J., 4,554,722, Cl. 29-426.500.

Eagon, Vicki L.; and Showers, Towanda S. Peel package sterile sanitary pads. 4,555,022, Cl. 206-440.000.

Eastman Kodak Company: *See—*
Frank, David S.; and Belly, Robert T., 4,555,396, Cl. 424-3.000.
LaRossa, Denise D.; Thunberg, Allen L.; Norton, Gary E.; and Dappen, Glen M., 4,555,484, Cl. 435-21.000.
LiMuti, Charles M.; Babb, Bruce E.; and Mauck, John C., 4,555,483, Cl. 435-19.000.
Reczek, James A.; and Palumbo, Janice M., 4,555,478, Cl. 430-367.000.
Washburn, William N., 4,555,477, Cl. 430-359.000.

Eastman Machine Company: *See—*
Barrett, Robert C.; Buscher, John H.; and Putnam, William M., 4,554,738, Cl. 30-275.000.

Eaton Corporation: *See—*
Sorger, Gunter U.; and Raicu, Dan, 4,555,683, Cl. 333-202.000.

Ebisawa, Mikio: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,555,369, Cl. 260-544.00F.

Echeverria, Luis. Self-locking-and-measuring ruler for computer-printout forms. 4,554,746, Cl. 33-447.000.

Eck, Leonard F., to Hein-Werner Corporation. Wheel lift device. 4,555,089, Cl. 254-10.00B.

Eckstein, Wolfgang, to Dragerwerk Aktiengesellschaft. Electrostatic filter construction. 4,555,252, Cl. 55-132.000.

Eden, Brent E., to Mud Hog Corporation. Auxiliary hydraulic drive system for road graders and the like. 4,554,991, Cl. 180-243.000.

Edgar, Edward J.: *See—*
Edgar, James W.; and Edgar, Edward J., 4,554,850, Cl. 83-178.000.
Edgar, James W.; and Edgar, Edward J. Machine for cutting V-belts from a V-belt band. 4,554,850, Cl. 83-178.000.
Edling, Robert J.; and Morgan, Karl L., to Research Corporation. Method and means for harvesting crayfish. 4,554,759, Cl. 43-100.000.
Edmondson, Morris S.: *See—*
Coleman, William M., III; and Edmondson, Morris S., 4,555,497, Cl. 502-115.000.
Effenberger, John A.; and Keese, Frank M., to Chemical Fabrics Corporation. Fluoropolymer coating and casting compositions and films derived therefrom. 4,555,543, Cl. 524-520.000.
Egbert, Leigh B.: *See—*
Johnson, Richard C.; and Egbert, Leigh B., 4,554,967, Cl. 165-134.100.
Eggendorfer, Gunnar: *See—*
Skolaude, Werner; and Eggendorfer, Gunnar, 4,555,256, Cl. 62-18.000.
Eguchi, Yasukata, to Janome Sewing Machine Industry Co. Ltd. Electronic sewing machine. 4,554,879, Cl. 112-445.000.
Eiler, Peter: *See—*
Blase, Helmut; and Eiler, Peter, 4,555,031, Cl. 212-189.000.
Eimer, Klaus: *See—*
Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., 4,554,965, Cl. 165-95.000.
Eisenhauer, Roy J.; Loeser, Cary A.; and Goodner, Charles G., Jr., to United States of America, Interior. Plugging factor monitor unit. 4,554,822, Cl. 73-61.00R.
Ekdahl, Wendell G.; Chaudhuri, Asit R.; and Miiller, William C., to Manville Service Corporation. High temperature refractory fiber. 4,555,492, Cl. 501-38.000.
Elastogran Maschinenbau GmbH: *See—*
Wallner, Josef; and Kelterbaum, Manfred, 4,555,087, Cl. 249-78.000.
Elcorsy Inc.: *See—*
Castegnier, Adrien, 4,555,320, Cl. 204-180.900.
Eldredge, Peter: *See—*
Broadbent, William H., Jr.; Buchholz, Steve; Eldredge, Peter; and Wihl, Mark J., 4,555,798, Cl. 382-8.000.
Electric Power Research, Inc.: *See—*
Appleby, A. John, 4,555,453, Cl. 429-41.000.
Electronic Processors, Inc.: *See—*
Platter, Sanford; Durand, Charles A.; and Gadsby, Larry R., 4,555,077, Cl. 242-198.000.
Electrovac, Fabrikation elektrotechnischer Spezialartikel Gesellschaft mbH: *See—*
Bayer, Helmut, 4,555,688, Cl. 337-394.000.
Elhaus, Friedrich W. Apparatus for severing extruded light sectional members. 4,554,851, Cl. 83-213.000.
Elliott, George: *See—*
Brightman, Barrie; Elliott, George; Lenk, Pedro A.; Shah, Jayantkumar R.; and Stewart, William H., 4,555,595, Cl. 179-18.0ES.
Elscint Ltd.: *See—*
Fenster, Paul; Netter, Zvi; and Shimoni, Yair, 4,555,728, Cl. 358-111.000.
EMA Company: *See—*
Guglielmo, Richard J., Sr., 4,555,356, Cl. 252-400.00R.
Emerson Electric Co.: *See—*
Spradling, Gene V.; and Stanek, Terrence L., 4,555,654, Cl. 318-751.000.
Endo, Mitsuo. Trigger assembly for rubber band gun. 4,554,904, Cl. 124-18.000.
Energy Conversion Devices, Inc.: *See—*
Guha, Subhendu; and DenBoer, William, 4,555,586, Cl. 136-259.000.
Eng, Benjamin, Jr.; Duryee, Peter S.; and Anholm, John M., Jr., to John Fluke Mfg. Co., Inc. Error correcting apparatus for systems such as analog to ...gital converters. 4,555,692, Cl. 340-347.0AD.
Engel, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Speed governing system for an internal combustion engine with self-ignition. 4,554,899, Cl. 123-357.000.
Engel, John F.; and Puglis, Joseph M., to FMC Corporation. Nematicidal 3-substituted-4-phenyl-1,2,5-thiadiazoles. 4,555,521, Cl. 514-362.000.
Engel, Michael R., to Minnesota Mining and Manufacturing Company. Conductive adhesive and biomedical electrode. 4,554,924, Cl. 128-640.000.
Engle, Elbert, to Chesebrough-Pond's, Inc. Apparatus for separating stacks of cloth. 4,555,102, Cl. 271-4.000.
Enomoto, Masao, to Ichikoh Industries Limited. Electric remote control mirror with half-ball portion. 4,555,166, Cl. 350-634.000.
Enriquez, Emanuel E., to Westinghouse Electric Corp. Elevator system. 4,555,724, Cl. 358-93.000.
Envirex Inc.: *See—*
Boyle, William H., 4,555,340, Cl. 210-248.000.
Erdmann, Fritz; and Simon, Ulrich, to Hoechst Aktiengesellschaft. Process of preparing light-sensitive naphthoquinonediazidesulfonic acid ester. 4,555,469, Cl. 430-168.000.
Eremity, Frank: *See—*
Arway, George; Eremity, Frank; Dick, George; and Pullen, Elaine, 4,555,712, Cl. 346-75.000.
Arway, George; Eremity, Frank; and Huang, Tung M., 4,555,719, Cl. 346-140.00R.
Erickson, Mervin L. Selectively free wheeling or drive hub for vehicles. 4,555,197, Cl. 403-1.000.
Ermanski, Albert G., to Wright Line, Inc. Tiltable and swivable mounting assembly for a video display terminal. 4,555,081, Cl. 248-183.000.
Esaki, Hiroshi, to Kasai, Kunio. Music box with indicator hoist mechanism. 4,554,856, Cl. 84-95.00C.
Escaravage, Gerard, to Aciers et Outillage Peugeot. Exterior control for a vehicle door provided with an electric latch. 4,554,808, Cl. 70-279.000.
Esmay, Edward N.: *See—*
Bridson, William D.; and Esmay, Edward N., 4,555,620, Cl. 250-205.000.
Essex Group, Inc.: *See—*
Pali, Christopher, 4,555,070, Cl. 242-58.100.
Essilor International Cie Generale d'Optique: *See—*
Tagnon, Luc, 4,554,917, Cl. 128-303.100.
Etablissement Public de Diffusion dit Telediffusion de France: *See—*
Mathieu, Michel G.; and Le Rodallec, Andre J. L., 4,555,736, Cl. 358-342.000.
Ethicon, Inc.: *See—*
Aday, Jorge L.; and Cerwin, Robert J., 4,555,016, Cl. 206-63.300.
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, to Beecham Group p.l.c. Anti-hypertensive benzo[b]pyran-3-ols. 4,555,509, Cl. 514-278.000.
Everett, Leroy J.; and DeFilippis, Stanley J., to Packard Instrument Company, Inc. Method and apparatus for determination of sample homogeneity in scintillation counting. 4,555,629, Cl. 250-362.000.
Evertz, Egon; and Pirdzun, Jorg, to Evertz, Egon. Process for the repair of slide plates. 4,555,094, Cl. 266-45.000.
Ewald Dorken AG: *See—*
Jablonka, Dieter; Urban, Klaus; Raidt, Heinz-Peter; and Schepers, Eberhard, 4,555,433, Cl. 428-166.000.
Ex-Cell-O Corporation: *See—*
Plummer, Jeffrey J., 4,555,093, Cl. 254-362.000.
Exxon Research & Engineering Company: *See—*
Deckman, Harry W.; Witzke, Horst; Wronski, Christopher; and Yablonovitch, Eli, 4,554,727, Cl. 29-572.000.
F. L. Smidth & Co. A/S: *See—*
Bhatia, Vinay K., 4,555,390, Cl. 423-242.000.
Hundebol, Soren, 4,555,388, Cl. 423-167.000.
F. Oberdorfer: *See—*
Krenkel, Bernhard; and Joos, Heinz, 4,554,954, Cl. 139-439.000.
Faber, Norman, Jr.: *See—*
Miller, William J.; and Faber, Norman, Jr., 4,555,238, Cl. 464-52.000.
Faflak, Daniel P.: *See—*
Dahl, Richard E.; Faflak, Daniel P.; and Sendelbach, Lee A., 4,555,701, Cl. 340-736.000.
Fairchild Camera & Instrument Corporation: *See—*
Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., 4,555,052, Cl. 228-104.000.
Fallon, Timothy R.: *See—*
Smith, Terry W.; and Fallon, Timothy R., 4,554,864, Cl. 99-340.000.
Fan, You-Ling: *See—*
Rosen, Meyer R.; Fan, You-Ling; and Chu, Nan S., 4,555,346, Cl. 210-734.000.
Fanuc Ltd.: *See—*
Inaba, Hajimu; and Sakakibara, Shinsuke, 4,555,758, Cl. 364-174.000.
Fanuc Ltd: *See—*
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,555,590, Cl. 178-18.000.
Farhi, Philippe F.: *See—*
Bossennec, Jean-Louis G.; Debuisser, Jean-Claude A.; and Farhi, Philippe F., 4,555,705, Cl. 343-55.00A.
Farquharson, Graeme J.: *See—*
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Houston, Timothy L., 4,555,263, Cl. 71-98.000.
Farrow, Desmond J., Sr.: *See—*
Newman, William E., Sr.; and Farrow, Desmond J., Sr., 4,554,906, Cl. 122-26.000.
Fedak, John F.; Findley, Gerald I.; and Torr, Terry A., to International Business Machines Corporation. Compaction and decompaction of non-coded information bearing signals. 4,555,802, Cl. 382-56.000.
Federal-Mogul Corporation: *See—*
Butler, John D., 4,555,376, Cl. 264-266.000.
Fehr, Friedhard: *See—*
Westermeir, Gisela; and Fehr, Friedhard, 4,555,745, Cl. 361-320.000.
Feinberg, Jeffrey N.: *See—*
White, Stephen R.; and Feinberg, Jeffrey N., 4,555,128, Cl. 281-45.000.
Feinbloom, William, to Designs for Vision, Inc. Anamorphic lens system increasing the field of view for the visually handicapped. 4,555,164, Cl. 350-420.000.
Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; and Stodt, Rolf, to SMS Schloemann-Siemag Aktiengesellschaft. Live-roller feed bed for conveying individual lengths of rolled stock in close succession to cooling beds. 4,554,813, Cl. 72-251.000.
Fenster, Paul; Netter, Zvi; and Shimoni, Yair, to Elscint Ltd. Digital fluorography. 4,555,728, Cl. 358-111.000.
Ferguson, Robert C., to Spar Aerospace Limited. Floating nut. 4,555,207, Cl. 411-366.000.
Fiberglas Canada Inc.: *See—*
Blackmore, Phillip W., 4,555,017, Cl. 206-83.500.

Fields, Ellis K., to Standard Oil Company. Carbamates of beta-hydroxyethylsulfoxides. 4,555,350, Cl. 252-8.55D.
Fields, F. Herbert. GO Game employing hexagonally shaped spaces. 4,555,116, Cl. 273-236.000.
Fights, Michael L.; and Jones, William E., to Ball Corporation. Spray apparatus with self cleaning nozzle. 4,555,416, Cl. 427-248.100.
Findeisen, Kurt: *See—*
Klauke, Erich; and Findeisen, Kurt, 4,555,370, Cl. 260-545.00R.
Findley, Gerald I.: *See—*
Fedak, John F.; Findley, Gerald I.; and Torr, Terry A., 4,555,802, Cl. 382-56.000.
Finkenzeller, Johann; and Hubert, Gunter, to Siemens Aktiengesellschaft. X-Ray film holder. 4,555,794, Cl. 378-187.000.
Fiol, James. Apparatus for the display or the storage of bicycles or like vehicles. 4,555,029, Cl. 211-22.000.
Fischer, Charles, to Strapex AG. Machine for strapping packages and the like. 4,554,779, Cl. 53-589.000.
Fischer, Herbert; Gorzinski, Manfred; Gress, Wolfgang; Meffert, Alfred; and Wegemund, Bernd, to Henkel KGaA. Alkyd resins containing hydroxyl groups. 4,555,564, Cl. 528-295.300.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink metering device for a printing machine having an ink trough-ink roller combination. 4,554,870, Cl. 101-365.000.
Fisher, Chester D., to Koppers Company, Inc. Material collector and discharger apparatus. 4,555,254, Cl. 55-345.000.
Fisher Controls International, Inc.: *See—*
Claney, Robert L.; Walton, Herbert H.; Kehoe, Steven D.; and Barron, Kimball R., 4,554,943, Cl. 137-242.000.
Fishkind, Gregory A.: *See—*
Maroney, Ralf P.; and Fishkind, Gregory A., 4,555,744, Cl. 361-212.000.
Five X Corporation: *See—*
Buschor, Josef J., 4,555,216, Cl. 414-728.000.
Flakt Aktiebolag: *See—*
Ziemer, Wolf; and Holle, Wilhelm, 4,554,766, Cl. 52-28.000.
Flanagan, James L.; and Kubli, Robert A., to AT&T Bell Laboratories. Teleconferencing acoustic transducer. 4,555,598, Cl. 179-121.00D.
Fleisch, Theo H.: *See—*
Sirovich, Bruce E.; Sandstrom, Robert L.; and Fleisch, Theo H., 4,555,395, Cl. 423-644.000.
Fletcher, Aaron N.; McManis, George E., III; and Bliss, Dan E., to United States of America, Navy. Ambient temperature thermal battery. 4,555,455, Cl. 429-112.000.
Fletcher, Ian J.: *See—*
Zink, Rudolf; and Fletcher, Ian J., 4,555,569, Cl. 544-105.000.
FMC Corporation: *See—*
Engel, John F.; and Puglis, Joseph M., 4,555,521, Cl. 514-362.000.
Kassai, Denes P., 4,554,992, Cl. 180-307.000.
Lee, Fui-Tseng H.; and Green, Joseph, 4,555,562, Cl. 528-72.000.
Mick, Jon L.; and Wolf, Marvin L., 4,555,032, Cl. 212-189.000.
Foley, Robert W.; Storck, Robert C.; Mickus, Donald J., deceased; and by Pastors, Debbie, executrix, to Dresser Industries, Inc. Conduit arrangement for tilt cylinder of a bulldozer. 4,554,979, Cl. 172-813.000.
Food Equipment Manufacturing Corporation: *See—*
Sauer, Robert L.; Morrissette, Charles G.; Garbaczik, Stanley J., Sr.; and Garbaczik, Stanley J., Jr., 4,554,852, Cl. 83-407.000.
Ford Motor Company: *See—*
Freitag, Otto W., 4,554,742, Cl. 33-143.00L.
King, Francis G.; and Gable, Stewart V., 4,554,824, Cl. 73-117.000.
Pryor, Marc I., 4,555,096, Cl. 267-8.00R.
Forenade Fabriksverken: *See—*
Johansson, Borje; Pramskog, Torbjorn; and Sandberg, Jan-Erik, 4,554,860, Cl. 89-1.700.
Forte Technology, Inc.: *See—*
Benson, Warren E.; and Breen, Stanley, 4,555,661, Cl. 324-61.00R.
Fory, Werner: *See—*
Thummel, Rudolph C.; and Fory, Werner, 4,555,262, Cl. 71-92.000.
Foster, Edward P.: *See—*
Bronfenbrenner, James C.; Foster, Edward P.; and Tewari, Krishna, 4,555,248, Cl. 44-78.000.
Foster, James O., to JFEC Corporation & Associates. Heating and cooling system monitoring apparatus. 4,555,057, Cl. 236-94.000.
Foster Wheeler Energy Corporation: *See—*
Johnson, Richard C.; and Egbert, Leigh B., 4,554,967, Cl. 165-134.100.
Fotouhi, Bahram: *See—*
Gregorian, Roubik; and Fotouhi, Bahram, 4,555,668, Cl. 330-9.000.
Frait, John S.; Lowman, Clark E.; Morris, George W., III; and Tribe, Leonard T., to Kelsey-Hayes Co. Position sensor. 4,555,120, Cl. 280-6.100.
Framatome & Cie: *See—*
Delor, Michel; and Bruyere, Michel, 4,555,382, Cl. 376-216.000.
Franci, Vittorio: *See—*
Carobbi, Renato; Miletti, Sandro; and Franci, Vittorio, 4,555,271, Cl. 127-46.200.
Francis, Alex W., Jr., to Combustion Engineering, Inc. Treatment of oil well production. 4,555,332, Cl. 210-104.000.
Frank, David S.; and Belly, Robert T., to Eastman Kodak Company. Use of pyrylium and thiapyrylium compounds as biological stains. 4,555,396, Cl. 424-3.000.
Franke, Milton E.: *See—*
Harvell, John K.; and Franke, Milton E., 4,555,079, Cl. 244-207.000.
Franklin, Kenneth W., to Bishopbarn Limited. Conveyor belt having vacuum system for retaining articles thereon. 4,555,013, Cl. 198-689.100.
Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Jablonka, Dieter; Urban, Klaus; Raidt, Heinz-Peter; and Schepers, Eberhard, 4,555,433, Cl. 428-166.000.
Freeland, Verne L. Built-in child's safety seat for vehicles. 4,555,135, Cl. 297-105.000.
Freitag, Otto W., to Ford Motor Company. Dimensional checking tool. 4,554,742, Cl. 33-143.00L.
French, Robert C. Method and apparatus for thermo-bonding seams in thermoplastic material. 4,555,293, Cl. 156-308.400.
Frentzel, Richard L., to Celotex Corporation, The. Polyoxyalkylene/unsaturated diester reaction product for cellular foam stabilization. 4,555,442, Cl. 428-318.400.
Frey, Gary T.; Strong, Douglas H.; and Urbanski, Janet B. Corrosion resistant lubricant coating composite. 4,555,445, Cl. 428-340.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Blase, Helmut; and Eiler, Peter, 4,555,031, Cl. 212-189.000.
Friedes, Albert; Greene, Thomas V.; Idenden, Frederick W.; Moeller, Kenneth L.; Musen, Robert M.; and O'Hara, John F., Jr., to AT&T Bell Laboratories. Telephone interexchange signaling protocol. 4,555,594, Cl. 179-18.00B.
Frisbie, Carl W.: *See—*
Mawby, Harold S.; and Frisbie, Carl W., 4,555,049, Cl. 222-517.000.
Frito-Lay, Inc.: *See—*
Kreager, William D., 4,555,289, Cl. 156-203.000.
Frohman, Richard J.: *See—*
Tsutsumi, Masataka; and Frohman, Richard J., 4,555,330, Cl. 209-254.000.
Froom, Thomas W. Carton for packaging ice cream or like frozen, initially liquid or semi-solid material. 4,555,027, Cl. 206-626.000.
Fuchizawa, Tetsuro: *See—*
Shiba, Keisuke; Fuchizawa, Tetsuro; Nakao, Sho; and Ohishi, Chikashi, 4,555,461, Cl. 430-49.000.
Fuesers, Wilhelm G.: *See—*
Stender, Erich; and Fuesers, Wilhelm G., 4,554,816, Cl. 72-368.000.
Fuji Electric Company, Ltd.: *See—*
Fujisawa, Hakubun; Nishiura, Masaharu; Haruki, Hiromu; and Uchida, Yoshiyuki, 4,555,636, Cl. 250-578.000.
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,555,801, Cl. 382-44.000.
Fuji Electric Corporate Research & Development, Ltd.: *See—*
Fujisawa, Hakubun; Nishiura, Masaharu; Haruki, Hiromu; and Uchida, Yoshiyuki, 4,555,636, Cl. 250-578.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Ohgami, Masaaki; Hara, Kazuo; and Abe, Kunihiro, 4,555,762, Cl. 364-431.090.
Fuji Photo Film Co., Ltd.: *See—*
Inoue, Noriyuki; Okazaki, Masaki; Yamamuro, Kiyohiko; and Takei, Haruo, 4,555,482, Cl. 430-574.000.
Kawamura, Kouichi; Aotani, Yoshimasa; and Umehara, Akira, 4,555,474, Cl. 430-281.000.
Kido, Keishiro; Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,555,464, Cl. 430-67.000.
Kitajima, Masao; Seshimoto, Osamu; and Mizutani, Shigemitsu, 4,555,274, Cl. 148-6.14R.
Miyatsuka, Hajime, 4,555,431, Cl. 428-141.000.
Sakaguchi, Yukihiko; Sato, Kozo; Naito, Hideki; and Hara, Hiroshi, 4,555,470, Cl. 430-203.000.
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,555,476, Cl. 430-351.000.
Sakai, Nobuo; Okazaki, Masaki; and Inagaki, Yoshio, 4,555,479, Cl. 430-372.000.
Shiba, Keisuke; Fuchizawa, Tetsuro; Nakao, Sho; and Ohishi, Chikashi, 4,555,461, Cl. 430-49.000.
Tamura, Kaoru; and Yamada, Sadami, 4,555,213, Cl. 414-412.000.
Uchiyama, Kaoru, 4,555,076, Cl. 242-195.000.
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; and Toya, Ichizo, 4,555,481, Cl. 430-550.000.
Yokoyama, Shigeki; Nakamura, Koki; Kouda, Jyounichi; and Sekiguchi, Nobuhisa, 4,555,480, Cl. 430-527.000.
Fujihara, Naoto: *See—*
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,555,801, Cl. 382-44.000.
Fujii, Kiyonobu: *See—*
Ueeda, Ryuhei; Fujii, Kiyonobu; and Narukawa, Hiroshi, 4,555,439, Cl. 428-221.000.
Fujii, Morizumi; Kakimoto, Hirofumi; and Fujino, Shinji, to Ina Seito Co., Ltd. Adhesive-backed tile panels and method for installation thereof. 4,554,769, Cl. 52-173.00R.
Fujii, Takayoshi: *See—*
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohara, Minoru; and Ando, Takao, 4,555,505, Cl. 514-42.000.
Fujii, Tatsuo; and Takeda, Shigetomo, to TDK Corporation. Casing for magnetic tape cassette. 4,555,021, Cl. 206-387.000.
Fujikura Ltd: *See—*
Nakamura, Koichi; Ishibashi, Masashi; Kameda, Hideki; and Makiyo, Minoru, 4,555,422, Cl. 428-36.000.
Fujimori, Motoyuki, to Shiojiri Kogyo Kabushiki Kaisha. Module for combination timepiece. 4,555,184, Cl. 368-88.000.
Fujimoto, Isao, to Sanyo Electric Co., Ltd. Tuner apparatus. 4,555,808, Cl. 455-180.000.

Fujino, Shinji: *See*—
Fujii, Morizumi; Kakimoto, Hirofumi; and Fujino, Shinji, 4,554,769, Cl. 52-173.00R.

Fujisawa, Hakubun; Nishiura, Masaharu; Haruki, Hiromu; and Uchida, Yoshiyuki, to Fuji Electric Company, Ltd.; and Fuji Electric Corporate Research & Development, Ltd. Pattern detector. 4,555,636, Cl. 250-578.000.

Fujita, Shinsaku: *See*—
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,555,476, Cl. 430-351.000.

Fujitsu Limited: *See*—
Gounji, Takashi; Kawatsu, Teruo; Kasai, Yoshihiko; and Takeuchi, Chikao, 4,555,682, Cl. 333-189.000.
Hayashi, Katsumi, 4,555,771, Cl. 364-900.000.
Okada, Seiji; Watanabe, Isao; Sawatari, Norio; Saito, Kazumasa; Narusawa, Toshiaki; and Okuyama, Hirofumi, 4,555,466, Cl. 430-106.600.

Fukui, Tsutomu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Video time base and drop out corrector. 4,555,734, Cl. 358-314.000.

Fukuju, Osamu; Inagaki, Yasuhiro; and Minoshima, Katsuji, to NCR Corporation. Overlapping document feed apparatus. 4,555,104, Cl. 271-228.000.

Fukumoto, Yasuhisa; and Moriyama, Noboru, to Kao Soap Co., Ltd. Maleic acid/(meth)acrylic acid copolymer. 4,555,557, Cl. 526-240.000.

Fukushi, Toshio: *See*—
Hirooka, Hiroshi; Yoshida, Yoshio; Fukushi, Toshio; Takeya, Yasuo; and Nagai, Satoshi, 4,554,805, Cl. 68-12.00R.

Fukushima, Yoneharu; and Wakai, Kiyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Warning signal generating device for vehicle. 4,555,690, Cl. 340-52.00F.

Fuller, Robert A.: *See*—
Morris, Jeffrey D.; and Fuller, Robert A., 4,555,384, Cl. 422-109.000.

Funk, Richard L., to Hercules Incorporated. Low detonation velocity explosive composition. 4,555,279, Cl. 149-92.000.

Fussell, Theodore J., to Thermometrics Inc. Pressure and temperature sensor. 4,554,927, Cl. 128-670.000.

G. D. Searle & Co.: *See*—
Dryden, Hugh L., Jr; and Hill, John B., 4,555,362, Cl. 260-112.50R.

G.D Societa' per Azioni: *See*—
Mattei, Riccardo; and Osti, Roberto, 4,555,281, Cl. 156-64.000.

Gabillet, Jean-Francois, to Jeumont-Schneider Corporation. Method and apparatus for determination of the state of an all-or-none modulated alternating signal in a perturbed environment. 4,555,791, Cl. 375-58.000.

Gable, Stewart V.: *See*—
King, Francis G.; and Gable, Stewart V., 4,554,824, Cl. 73-117.000.

Gadsby, Larry R.: *See*—
Platter, Sanford; Durand, Charles A.; and Gadsby, Larry R., 4,555,077, Cl. 242-198.000.

Gaida, Wolfram: *See*—
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Galletto, Joseph L. Internal pliers. 4,554,848, Cl. 81-447.000.

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Jonsson, Ernst U.; Lindqvist, Sten-Borje; and Wimmerstedt, Roland V., 4,555,251, Cl. 55-48.000.

Gamson, Alan R.; and Kellner, Phillip R., to Crossfield Electronic Limited. Method of making a planographic printing member with aluminium silicate. 4,555,475, Cl. 430-309.000.

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Sauer, Robert L.; Morrissette, Charles G.; Garbaczik, Stanley J., Sr.; and Garbaczik, Stanley J., Jr., 4,554,852, Cl. 83-407.000.

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Sauer, Robert L.; Morrissette, Charles G.; Garbaczik, Stanley J., Sr.; and Garbaczik, Stanley J., Jr., 4,554,852, Cl. 83-407.000.

Garcia, Enrique, to Perkin-Elmer Corporation, The. Image acquisition system. 4,555,733, Cl. 358-293.000.

Gardner, William B.; Patel, Parbhubhai D.; Philen, Dan L.; and Santana, Manuel R., to AT&T Bell Laboratories. Measuring compression of cabled optical fibers. 4,555,175, Cl. 356-32.000.

Gargas, Eugene F., to Wooster Brush Company, The. Plug and filter assembly for paint sprayer. 4,555,337, Cl. 210-238.000.

Garman, James A., to Caterpillar Tractor Co. Apparatus and method for turning a track bushing. 4,554,720, Cl. 29-402.010.

Garner, Alfred V.; and Nalder, William W., to Power-Aid Industries (1980) Ltd. Lubricant additive. 4,555,352, Cl. 252-35.000.

Garner, John N., to Northern Telecom Limited. Manufacture of telecommunications cable core units. 4,554,782, Cl. 57-66.000.

Garrett Corporation, The: *See*—
Klauss, Reinhard M.; and Suriano, Francis J., 4,555,187, Cl. 384-103.000.
Weigand, Francis K.; and Nickel, William H., 4,554,784, Cl. 60-39.020.

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Ambros, Peter; and Gatzke, Erich, 4,555,533, Cl. 523-440.000.

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Goebel, Eickhart, 4,554,833, Cl. 73-457.000.
Sander, Rembrandt, 4,554,734, Cl. 29-818.000.

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Gendron, Gary E.: *See*—
Sykes, Donald J.; and Gendron, Gary E., 4,555,023, Cl. 206-446.000.

General Battery Corporation: *See*—
Anderson, Carl; and Craig, Richard H., 4,555,459, Cl. 429-211.000.

General Eastern Instruments Corporation: *See*—
Harding, John C., Jr., 4,554,793, Cl. 62-126.000.

General Electric Company: *See*—
Avakian, Roger W., 4,555,540, Cl. 524-130.000.
Bradley, Irving, 4,555,748, Cl. 362-61.000.
Collins, Michael F.; and Lordi, Francis D., 4,555,612, Cl. 219-121.00P.
Leskovec, Robert A.; Davenport, John M.; and von Herrmann, Pieter J., 4,555,647, Cl. 315-179.000.
Lucas, Gary M., 4,555,420, Cl. 427-387.000.
Napoli, Phillip D.; and Patterson, William R., 4,554,789, Cl. 60-751.000.
Sadlo, James L.; and Musil, Gary D., 4,554,732, Cl. 29-620.000.
Shu, Peter H., 4,555,538, Cl. 524-102.000.

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Kramer, Franklin; Bruins, Henderikus B.; Giacone, Joseph; and Carbillet, Luc L., 4,555,407, Cl. 426-5.000.

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Rifkin, Gary L.; Lawrence, Charles C.; Zilber, Sam; and Hamby, Michael, 4,555,749, Cl. 362-249.000.

General Motors Corporation: *See*—
Baker, Peter J., 4,555,002, Cl. 192-45.000.
Lederman, Frederick E., 4,555,190, Cl. 384-495.000.
Vecellio, Anthony M., 4,554,893, Cl. 123-41.830.

General Safety Corporation: *See*—
Schmidt, Timothy J.; and Heintzleman, Ronald A., 4,555,075, Cl. 242-107.40A.

General Signal Corporation: *See*—
Wright, Eric, 4,555,766, Cl. 364-426.000.

Genne, Lee A.: *See*—
Chartrain, Armand N.; and Genne, Lee A., 4,555,159, Cl. 339-239.000.

GenRad, Inc.: *See*—
Swanson, Mark, 4,555,783, Cl. 371-15.000.

GEO VANN, Inc.: *See*—
Vann, Roy R.; and George, Flint R., 4,554,975, Cl. 166-297.000.

George, Flint R.: *See*—
Vann, Roy R.; and George, Flint R., 4,554,975, Cl. 166-297.000.

Gerhards, Ludwig, to Clemens Gerhards Holzwarenfabrik KG. Beer mug. 4,555,034, Cl. 215-100.00R.

Gerlach, LeRoy E.: *See*—
Polad, Michael D.; Gerlach, LeRoy E.; and Schmidt, Robert H., 4,555,610, Cl. 219-121.0LA.

Gerth, Christian: *See*—
Droescher, Michael; Mumcu, Salih; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, 4,555,550, Cl. 525-424.000.

Getz, Marlyn F., to Cabot Corporation. Method for improving handling properties of a flaked tantalum powder composition. 4,555,268, Cl. 75-229.000.

Geurtsen, Friedrich H. H.; Anemaet, John M.; Smith, Donald R.; and Boyd, Mary G., to Dennison Manufacturing Co. Heat transferable laminate. 4,555,436, Cl. 428-200.000.

Giacone, Joseph: *See*—
Kramer, Franklin; Bruins, Henderikus B.; Giacone, Joseph; and Carbillet, Luc L., 4,555,407, Cl. 426-5.000.

Gibson, Dennis H.; Stockner, Alan R.; and Waldman, Donald J., to Caterpillar Tractor Co. Fluid distributing apparatus. 4,554,901, Cl. 123-450.000.

Gibson, John M.; Jacobson, Dale C.; Poate, John M.; and Tung, Raymond T., to AT&T Bell Laboratories. Formation of heterostructures by pulsed melting of precursor material. 4,555,301, Cl. 156-617.00R.

Gibson, Paul W.; and Orthoefer, Frank T., to A. E. Staley Manufacturing Company. Method for coating a substrate with a foamed proteinaceous product. 4,555,417, Cl. 427-361.000.

Gibson, William D., to Gibson, William D. Replaceable roll for roller mill. 4,555,066, Cl. 241-293.000.

Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., to Nalco Chemical Company. Terpolymers of 2-acrylamido-2-methylpropanesulfonic acid, sodium salt (AMPS), N,N-dimethylacrylamide, and acrylonitrile. 4,555,558, Cl. 526-287.000.

Gill, David. Pantographs. 4,554,740, Cl. 33-25.00R.

Gindre, Jean: *See*—
Mirebeau, Pierre; and Gindre, Jean, 4,555,458, Cl. 429-203.000.

Giovanni Tradigo S.n.c.: *See*—
Tradigo, Angelo; and Tradigo, Francesco, 4,554,694, Cl. 12-136.00B.

Gipperich, Theodor: *See*—
Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; and Stodt, Rolf, 4,554,813, Cl. 72-251.000.

Girardat, Roland: *See*—
Blanchandin, Monique; Girardat, Roland; and Vanestrenvord, Jean-Michel, 4,555,675, Cl. 330-289.000.

GIVAG Gastro-Installationen-Vertrieb (Deutschland) GmbH: *See*—
Butenschon, Rolf, 4,555,040, Cl. 215-365.000.

Glass, Alastair M.; Johnson, Anthony M.; and Liao, Paul F., to AT&T Bell Laboratories. Photodetector having semi-insulating material and a contoured, substantially periodic surface. 4,555,622, Cl. 250-211.00J.

Glassman, Aaron: *See*—
Cusumano, Salvatore V.; and Glassman, Aaron, 4,554,877, Cl. 112-105.000.

Glenoit Mills, Inc.: *See*—
Thore, Thomas J., 4,554,801, Cl. 66-9.00B.

Glenwood Manufacturing Corporation: *See*—
Goettsch, Michael R., 4,555,063, Cl. 241-46.040.

Glory Kogyo Kabushiki Kaisha: *See*—
Asami, Kazuto; Baba, Takao; Nakamura, Minoru; and Tanaka, Mitsuaki, 4,554,775, Cl. 53-64.000.

Goebel, Eickhart, to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik. Method and apparatus for determining the unbalance of wheels mounted on the drive axle of an automobile. 4,554,833, Cl. 73-457.000.

Goettsch, Michael R., to Glenwood Manufacturing Corporation. Liquid waste agitating and pumping apparatus. 4,555,063, Cl. 241-46.040.

Gojo, Tomomi, to Ricoh Company, Ltd. Method of reducing character font. 4,555,191, Cl. 400-121.000.

Goldmann, Siegfried; Bossert, Friedrich; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, to Bayer Aktiengesellschaft. Circulation-active novel chromone- and thiochromone-substituted 1,4-dihydropyridine-lactones. 4,555,512, Cl. 514-302.000.

Goldner, Walther, to Keiper Recaro GmbH & Co. Back rest for a vehicle seat, particularly a motor vehicle seat. 4,555,137, Cl. 297-284.000.

Goldstein, Vladimir. Thermal storage heat exchanger systems of heat pumps. 4,554,797, Cl. 62-434.000.

Goller, Ernst; Ploppa, Jurgen; and Walker, Fritz, to H. Stoll GmbH & Company. Adjustment of stitch cams in a knitting machine. 4,554,802, Cl. 66-71.000.

Goodfellow, Anthony G., to W & A Bates Ltd. Method for building tires. 4,555,287, Cl. 156-127.000.

Goodlove, Gerol L. Safety hitch pin. 4,555,125, Cl. 280-515.000.

Goodner, Charles G., Jr.: *See*—
Eisenhauer, Roy J.; Loeser, Cary A.; and Goodner, Charles G., Jr., 4,554,822, Cl. 73-61.00R.

Goodwin, Alton C.; Junglen, Mark T.; and Kent, John S., to Baker International Corporation. Method and apparatus for a fluidized bed heat exchanger. 4,554,963, Cl. 165-1.000.

Goodyear Aerospace Corporation: *See*—
Uram, John R., Jr., 4,555,450, Cl. 428-412.000.

Goodyear Tire & Rubber Company, The: *See*—
Wenning, Thomas J.; and Lynn, Charles E., 4,555,198, Cl. 403-130.000.

Goris, Heinrich: *See*—
Holz, Joachim; Meier, Wolfgang; Schwarting, Karl-Heinz; Goris, Heinrich; and Ogorek, Kurt, 4,555,142, Cl. 299-43.000.

Gorzinski, Manfred: *See*—
Fischer, Herbert; Gorzinski, Manfred; Gress, Wolfgang; Meffert, Alfred; and Wegemund, Bernd, 4,555,564, Cl. 528-295.300.

Goscenski, Edward J., Jr. Positive drive and secondary clutch means therefor. 4,554,845, Cl. 74-650.000.

Goto, Kazuhiro; Yaoka, Osamu; and Oe, Takanori, to Yoshitomi Pharmaceutical Industries, Ltd. Therapeutic agent for hypertension. 4,555,510, Cl. 514-291.000.

Gottlieb, Milton; and Steinbruegge, Kenneth B., to Westinghouse Electric Corp. Method and apparatus for strain relieving transducers bonded to acousto-optic devices. 4,555,160, Cl. 350-358.000.

Gotzke, Wolfgang: *See*—
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,554,715, Cl. 28-107.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,424, Cl. 428-91.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,425, Cl. 428-91.000.

Gould, Inc.: *See*—
Shuster, Nicholas, 4,555,454, Cl. 429-51.000.

Gounji, Takashi; Kawatsu, Teruo; Kasai, Yoshihiko; and Takeuchi, Chikao, to Fujitsu Limited. Mechanical filter. 4,555,682, Cl. 333-189.000.

Grachtrup, Heinz, to Krupp Polysius AG. Rotary kiln with cooler. 4,554,876, Cl. 110-246.000.

Graetz, Herbert; and Unterreiner, Ronald C., to Blair Industries, Inc. Method of making cassette holders. 4,555,290, Cl. 156-245.000.

Graham, Wayne B.; and Bonn, John, to Tentel Corporation. Universal head protrusion gauge for video recorders. 4,554,743, Cl. 33-172.00R.

Grant, Blake F. Ribbon filter apparatus. 4,555,342, Cl. 210-488.000.

Grant, Charles R. Tie tack. 4,554,710, Cl. 24-49.0CF.

Graves, James E.; and Graves, Joan M. K. Cooking grease collection pot. 4,555,339, Cl. 210-244.000.

Graves, Joan M. K.: *See*—
Graves, James E.; and Graves, Joan M. K., 4,555,339, Cl. 210-244.000.

Gray, Randall C.; and Jarrett, Robert B., to Motorola, Inc. Short detection circuit and method for an electrical load. 4,555,742, Cl. 361-93.000.

Graziani, Dante J., Jr.: *See*—
Dickhart, William W., III; Graziani, Dante J., Jr.; Herring, James M., Jr.; Pavlick, Michael J.; and Renn, Edward J., 4,555,095, Cl. 267-4.000.

Great Bend Manufacturing Co., Inc.: *See*—
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Grecksch, Hans: *See*—
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Green Cross Corporation, The: *See*—
Arimura, Hirofumi; Uemura, Yahiro; and Okuno, Yoshiomi, 4,555,401, Cl. 424-89.000.

Green, Joseph: *See*—
Lee, Fui-Tseng H.; and Green, Joseph, 4,555,562, Cl. 528-72.000.

Greenberg, Dan. Ejector device and method for producing same. 4,554,956, Cl. 141-65.000.

Greene, Thomas V.: *See*—
Friedes, Albert; Greene, Thomas V.; Idenden, Frederick W.; Moeller, Kenneth L.; Musen, Robert M.; and O'Hara, John F., Jr., 4,555,594, Cl. 179-18.00B.

Greeson, Arnold J., to Mead Corporation, The. Ink reconstitution system and method for ink drop printer. 4,555,709, Cl. 346-1.100.

Gregor, Barbara; and Huckfeldt, Gebhard, to Huckfeldt & Thorlichen. Sausage. 4,555,408, Cl. 426-90.000.

Gregorian, Roubik; and Fotouhi, Bahram, to American Microsystems, Inc. Gain amplifier. 4,555,668, Cl. 330-9.000.

Gregorovich, Charles J.: *See*—
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,554,814, Cl. 72-345.000.

Greiner, Gunter: *See*—
Lange, Wolf-Ruediger; Wessel, Anton; Bohler, Udo; Volkheimer, Klaus; Greiner, Gunter; and Islet, Peter, 4,555,806, Cl. 455-62.000.

Greschke, Manfred: *See*—
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,554,715, Cl. 28-107.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,424, Cl. 428-91.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,425, Cl. 428-91.000.

Gress, Wolfgang: *See*—
Fischer, Herbert; Gorzinski, Manfred; Gress, Wolfgang; Meffert, Alfred; and Wegemund, Bernd, 4,555,564, Cl. 528-295.300.

Grimes, John R.: *See*—
Grimes, Philip M.; and Grimes, John R., 4,554,765, Cl. 51-401.000.

Grimes, Philip M.; and Grimes, John R. Coated abrasive disc. 4,554,765, Cl. 51-401.000.

Grognard, Leon L., to Societe Belge d'Exploitation de la Navigation Aerienne (SABENA). Apparatus for the suspension of an aircraft engine cowling. 4,555,078, Cl. 244-54.000.

Grollier, Jean-Francois; Monnais, Christian; and Peritz, Lyonel, to L'Oreal. Process for preparing a hair dye or hair bleach composition; a composition for use in this process; and the use of said composition to dye or bleach hair. 4,555,246, Cl. 8-405.000.

Gross, Rainer: *See*—
Goldmann, Siegfried; Bossert, Friedrich; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,555,512, Cl. 514-302.000.

Gross, Tony H. Compact animal feeder trough. 4,554,888, Cl. 119-53.000.

Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., to Minster Machine Company, The. Air transfer system and method for a shell press. 4,554,814, Cl. 72-345.000.

Gruber, Klaus; Lohner, Manfred; Posselt, Klaus; and Wagener, Hans H., to Dolorgiet GmbH & Co KG. Transdermal 2-(4-isobutylphenyl)-propionic acid medication and methods. 4,555,524, Cl. 514-570.000.

Gruich, Peter; and Stopke, J. Lawrence. Multimotor modular electric drive powertrain system for turbine powered vehicles. 4,554,989, Cl. 180-65.400.

Grumman Aerospace Corporation: *See*—
Tobin, Albert G., 4,555,275, Cl. 148-6.300.

Gruna, Leo, to Gruna, Leo. Crush resistant motor vehicle body. 4,555,134, Cl. 296-189.000.

GTE Business Communication Systems Inc.: *See*—
Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,555,597, Cl. 179-90.00B.

GTE Communication Systems Corporation: *See*—
Neese, Wayne E.; and Stepan, William E., 4,555,151, Cl. 339-17.0CF.

GTE Products Corporation: *See*—
Cheresnowsky, Michael J., 4,555,386, Cl. 423-54.000.

Guelph Elastic Hosiery Company Limited: *See*—
Kent, David, 4,555,234, Cl. 441-106.000.

Gueussier, Andre; and Vachiery, Edmond, to Vallourec. Method of treating steel with calcium, to obtain a steel well adapted to cold forming, with a low silicon content. 4,555,265, Cl. 75-53.000.

Guglielmo, Richard J., Sr., to EMA Company. Wood preservative system composition. 4,555,356, Cl. 252-400.00R.

Guha, Subhendu; and DenBoer, William, to Energy Conversion Devices, Inc. Photovoltiac device having long term energy conversion stability and method of producing same. 4,555,586, Cl. 136-259.000.

Gunnarsson, Kristjan: *See*—
Prinz, Friedrich B.; Hoburg, James F.; and Gunnarsson, Kristjan, 4,554,834, Cl. 73-597.000.

Gunter, Gerhard; and Haeufler, Hartmut, to Akzo nv. Process for applying a coating to a substrate and a liquid aqueous composition to be used therein. 4,555,412, Cl. 427-27.000.

Guthrie, Roderick I. L.: *See*—
Doutre, Don A.; and Guthrie, Roderick I. L., 4,555,662, Cl. 324-71.400.

Guttinger, Heinz: *See*—
Muggli, Jurg; Guttinger, Heinz; and Horvath, Zoltan, 4,555,634, Cl. 250-565.000.

Gyugyi, Laszlo, to Westinghouse Electric Corp. Static VAR generator system having improved response time. 4,555,659, Cl. 323-210.000.

H. H. Robertson Company: *See—*
Marwah, Ashok K.; and Norris, Charles H., Jr., 4,554,771, Cl. 52-221.000.

H. Stoll GmbH & Company: *See—*
Goller, Ernst; Ploppa, Jurgen; and Walker, Fritz, 4,554,802, Cl. 66-71.000.
Schmodde, Hermann; and Haltenhof, Hans-Gunter, 4,554,803, Cl. 66-75.200.

Haas, Rudy E., to Carrier Corporation. Wrapped fin heat exchanger circuiting. 4,554,968, Cl. 165-144.000.

Haase, Donald A., to Mobil Oil Corporation. Animal repellent bag package and method of preparing the same. 4,555,015, Cl. 206-0.500.

Habel, Paul A.; and Kulczycki, Elaine S., to Borg-Warner Corporation. Minimum complexity vibration damper. 4,555,009, Cl. 192-106.200.

Haberman, Louis J. Plastic orthotic therapeutic device. 4,554,912, Cl. 128-80.00E.

Hackett-Jones, Francis C.; and Kiko, Frederick H., to Telspec Limited. Signal transmission devices. 4,555,599, Cl. 179-170.00R.

Hada, Hiroshi; and Hirayama, Tsutomu, to NEC Corporation. Pulse signal control circuits with improved turn-off characteristic. 4,555,641, Cl. 307-254.000.

Haeufler, Hartmut: *See—*
Gunter, Gerhard; and Haeufler, Hartmut, 4,555,412, Cl. 427-27.000.

Hafner, Udo: *See—*
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,555,060, Cl. 239-585.000.

Hagen, Glenn E., to Williams, Inc. Sea water distillation system. 4,555,307, Cl. 202-177.000.

Hagyuda, Nobuyoshi: *See—*
Iida, Yoshikazu; and Hagyuda, Nobuyoshi, 4,555,648, Cl. 315-241.00P.

Hai-Ping, Kuo. Ball-hitting training device. 4,555,110, Cl. 273-26.00E.

Hajime Industries, Ltd.: *See—*
Yoshida, Hajime, 4,555,635, Cl. 250-572.000.

Hakes, Gary A., to Ingersoll-Rand Company. Drill box support mechanism for mining bolter machines. 4,554,984, Cl. 175-170.000.

Halcon SD Group, Inc., The: *See—*
Armstrong, William D., 4,555,501, Cl. 502-243.000.

Hall, Dale E., to Inco Alloys International, Inc. Process for preparing H_2 evolution cathodes. 4,555,413, Cl. 427-34.000.

Hall, George D.: *See—*
Hynes, Joseph H.; Morrill, Charles D.; and Hall, George D., 4,554,976, Cl. 166-341.000.

Hall, Randall C., to O. I. Corporation. Electrolytic conductivity detector. 4,555,383, Cl. 422-89.000.

Hall, Richard W.; Sonnenberg, Sven; and Mahal, Harbhajan S., to Towler Hydraulics, Inc. Regeneration system for a hydraulic intensifier unit. 4,555,220, Cl. 417-342.000.

Hall, Steven E.; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted thio prostaglandin analogs and their use in the treatment of thrombolytic disease. 4,555,523, Cl. 514-469.000.

Hallam, Donald E.: *See—*
Angelucci, Richard J.; Cope, Andrew P.; Hallam, Donald E.; and Ladd, Harry E., 4,555,067, Cl. 242-35.50A.

Halldorsson, Thorsteinn: *See—*
Langerholc, John; and Halldorsson, Thorsteinn, 4,555,179, Cl. 356-342.000.

Halliburton Company: *See—*
Rao, S. Prabhakara; and Burkhalter, John F., 4,555,269, Cl. 106-90.000.

Haltenhof, Hans-Gunter: *See—*
Schmodde, Hermann; and Haltenhof, Hans-Gunter, 4,554,803, Cl. 66-75.200.

Hamada, Masaaki; Okamaoto, Kaoru; and Kurosaki, Teikichi, to Nippon Zoki Pharmaceutical Co. 1,2 Dihydro- and 1,2,3,4-tetrahydro quinolylacetic acids and analgesic use thereof. 4,555,513, Cl. 514-311.000.

Hamano, Hideo, to Toyota Jidosha Kabushiki Kaisha. Air breather for power transmission unit. 4,554,844, Cl. 74-606.00R.

Hamby, Michael: *See—*
Rifkin, Gary L.; Lawrence, Charles C.; Zilber, Sam; and Hamby, Michael, 4,555,749, Cl. 362-249.000.

Hamman, Martin E.; and Baughman, Gary M., to Rieke Corporation. Vented nestable pouring spout. 4,555,048, Cl. 222-478.000.

Hammond, Geoffrey R., to Reckitt & Colman Products Limited. Applicator with resilient valve. 4,555,194, Cl. 401-206.000.

Hampton, Ernestine. Mechanical egg breaker and separator. 4,554,866, Cl. 99-499.000.

Hampton, Steve: *See—*
Andrus, Robert E.; and Hampton, Steve, 4,555,297, Cl. 156-461.000.

Hanaoka, Naohiro, to Olympus Optical Co., Ltd. Magnetic recording medium and method for manufacturing the same. 4,555,444, Cl. 428-336.000.

Handa, Tadahiko: *See—*
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Handicart Limited: *See—*
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Hane, Toshioki: *See—*
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Hanlet, Jacques M.; and Tarantino, Elia R. J., to Alpha-Omega Development Inc. Electromagnetic energy absorber. 4,554,908, Cl. 126-443.000.

Hanly, Leo D. V. Bow stroke simulator. 4,554,859, Cl. 84-283.000.

Hann, Bruno: *See—*
Gassner, Theo; Hann, Bruno; and Kindle, Edwin, 4,554,861, Cl. 91-446.000.

Hara, Hiroshi: *See—*
Sakaguchi, Yukihiko; Sato, Kozo; Naito, Hideki; and Hara, Hiroshi, 4,555,470, Cl. 430-203.000.

Hara, Kazuo: *See—*
Ohgami, Masaaki; Hara, Kazuo; and Abe, Kunihiro, 4,555,762, Cl. 364-431.090.

Harada, Hiroyuki: *See—*
Komatsu, Hideo; Harada, Hiroyuki; and Matsuki, Tomiji, 4,555,542, Cl. 524-178.000.

Harada, Koji: *See—*
Matsushita, Yasuo; Nakamura, Kousuke; and Harada, Koji, 4,555,358, Cl. 252-516.000.

Harada, Shigeru: *See—*
Asano, Juichi; Okubo, Yasuo; Saito, Hiroshi; and Harada, Shigeru, 4,555,064, Cl. 241-89.300.

Harding, John C., Jr., to General Eastern Instruments Corporation. Controlled power converter for thermoelectric heat pump drive. 4,554,793, Cl. 62-126.000.

Harjunmaa, Hannu, to Labsystems Oy. Method for the measurement of the difference in the optical properties dependent on the light direction of two samples. 4,555,178, Cl. 356-339.000.

Harklau, Lanny L.: *See—*
Tait, William C.; and Harklau, Lanny L., 4,555,291, Cl. 156-250.000.

Harms, Margret; Bruns, Angelika; Luthje, Holger; and Matthiessen, Bernd, to U.S. Philips Corporation. Mask for the formation of patterns in lacquer layers by means of X-ray lithography and method of manufacturing same. 4,555,460, Cl. 430-5.000.

Harrington, Richard F.; Dagiel, Richard T.; and Brown, Villy, to Aetna Bearing Company. Self adjusting thrust, low angular contact bearing. 4,555,007, Cl. 192-98.000.

Harris Corporation: *See—*
Talbot, Robert D., 4,555,805, Cl. 455-26.000.

Harrod, Lawrence R.; and Perego, Lucio C., to Pines of America, Inc. Storage battery with built-in fuse. 4,555,451, Cl. 429-1.000.

Hart, Edwin R. Cereal processing. 4,555,409, Cl. 426-242.000.

Hartmann, Joseph C. Exercising machine. 4,555,109, Cl. 272-73.000.

Haruki, Hiromu: *See—*
Fujisawa, Hakubun; Nishiura, Masaharu; Haruki, Hiromu; and Uchida, Yoshiyuki, 4,555,636, Cl. 250-578.000.

Harvell, John K.; and Franke, Milton E., to United States of America, Air Force. Multiple jet blowing around the blunt trailing edge of a circulation controlled airfoil. 4,555,079, Cl. 244-207.000.

Harvey, Kenneth C. Tracking scooter and the like and method of operation. 4,555,122, Cl. 280-87.04R.

Harwood, Leopold A.; and Shanley, Robert L., II, to RCA Corporation. Tri-level sandcastle pulse decoder. 4,555,722, Cl. 358-17.000.

Hase, Tadaharu: *See—*
Toyoda, Yoshiaki; Wakimura, Kazuo; Hase, Tadaharu; and Arashiba, Nobumasa, 4,555,583, Cl. 568-473.000.

Hasegawa, Tetsuo; and Suematsu, Koushi, to Canon Kabushiki Kaisha. Developer having improved flow characteristics and a process for producing same. 4,555,467, Cl. 430-110.000.

Hasegawa, Toshiaki; and Hirose, Yasuo, to Nippon Furnace Kogyo Kaisha, Ltd. Simulator of fluid flow in field of flow entailing combustion or reaction. 4,554,832, Cl. 73-432.00R.

Hashimoto, Mitsuru, to Ricoh Co., Ltd. 2,6-Disazo anthraquinone compounds. 4,555,567, Cl. 534-654.000.

Haslanger, Martin F.: *See—*
Hall, Steven E.; and Haslanger, Martin F., 4,555,523, Cl. 514-469.000.

Haslberger, Richard: *See—*
Kern, Hans; and Haslberger, Richard, 4,554,939, Cl. 137-99.000.

Hatano, Yuji: *See—*
Kotera, Nobuo; Hatano, Yuji; Asano, Atsushi; and Kawabe, Ushio, 4,555,643, Cl. 307-476.000.

Hauni-Werke Korber & Co. KG: *See—*
Born, Siegfried, 4,554,931, Cl. 131-84.400.

Haupt, Randy L. Simultaneous nulling in the sum and difference patterns of a monopulse radar antenna. 4,555,706, Cl. 343-379.000.

Hauptman, Zdenek V.: *See—*
Banister, Arthur J.; Hauptman, Zdenek V.; and Kendrick, Aidan G., 4,555,316, Cl. 204-59.00R.

Hausler, Michael; Huber, Philippe; Pfyl, Walter; and Sadek, Kadry, to BBC Brown, Boveri and Company, Limited. Circuit arrangement for the compensation of reactive power in an electrical alternating-current power system. 4,555,658, Cl. 323-210.000.

Hayashi, Katsumi, to Fujitsu Limited. Data processing system for data base management of matrix type data. 4,555,771, Cl. 364-900.000.

Hayashi, Kiyotaka: *See—*
Kamiya, Tadashi; and Hayashi, Kiyotaka, 4,554,990, Cl. 180-197.000.

Hayashi, Masaharu: *See—*
Nakamura, Ryuji; and Hayashi, Masaharu, 4,555,004, Cl. 192-58.00B.

Hayashi, Takehiko; Ikuta, Hiroyuki; and Ohta, Takanori, to Toyoda Koki Kabushiki Kaisha. Crankpin rolling apparatus. 4,554,811, Cl. 72-110.000.

Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Coolant level control arrangement for internal combustion engine. 4,554,891, Cl. 123-41.210.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Pulley for cogged belt and method for producing same. 4,555,240, Cl. 474-152.000.
Hayashibara, Ken: *See*—
Masaki, Kazumi, 4,555,741, Cl. 361-58.000.
Hayashida, Morimasa: *See*—
Umeno, Hiroshi; Saito, Gunji; and Hayashida, Morimasa, 4,554,780, Cl. 56-11.800.
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, to Hitachi, Ltd. Oil feeding device for scroll fluid apparatus. 4,555,224, Cl. 418-55.000.
Health Education Publication Company, Inc.: *See*—
Lally, James J., 4,554,910, Cl. 128-28.000.
Heat and Control, Inc.: *See*—
Caridis, Andrew A.; Benson, Clark K.; and Klein, Lawrence F., 4,554,865, Cl. 99-353.000.
Heffner, Richard M.: *See*—
Over, William R.; Wion, Donald A.; and Heffner, Richard M., 4,554,725, Cl. 29-564.400.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Hydroxyaromatic oligomers of a mixed cyanate and aromatic polyamine and epoxy resins thereof. 4,555,553, Cl. 525-523.000.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Oligomeric vinyl ester resin compositions containing triazine groups and imino carbamate linkages. 4,555,554, Cl. 525-531.000.
Hefner, Robert E., Jr.; and White, Mary N., to Dow Chemical Company, The. Imide functional polyphenols; thermosettable compositions containing same and cured products therefrom. 4,555,563, Cl. 528-96.000.
Heilmann, Horst: *See*—
Ploch, Siegfrid; Rossler, Sonja; Zeisberg, Peter; and Heilmann, Horst, 4,554,804, Cl. 66-214.000.
Hein-Werner Corporation: *See*—
Eck, Leonard F., 4,555,089, Cl. 254-10.00B.
Heintzleman, Ronald A.: *See*—
Schmidt, Timothy J.; and Heintzleman, Ronald A., 4,555,075, Cl. 242-107.40A.
Heitmann, Jurgen, to Robert Bosch GmbH. Method of providing smooth transition from one to another of two sequences of digitally coded sound signals (fading). 4,555,737, Cl. 360-13.000.
Heller, Clarence: *See*—
Smyly, Harold M.; Miller, Charles D.; Cloyd, Richard A.; and Heller, Clarence, 4,554,905, Cl. 124-56.000.
Hendry, James W., to Lang Fastener Corporation. Apparatus for making a twin-wall, internally corrugated plastic structural part with a smooth non-cellular skin. 4,555,225, Cl. 425-4.00R.
Henkel KGaA: *See*—
Fischer, Herbert; Gorzinski, Manfred; Gress, Wolfgang; Meffert, Alfred; and Wegemund, Bernd, 4,555,564, Cl. 528-295.300.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Bruns, Klaus; and Weber, Ursula, 4,555,359, Cl. 252-522.00R.
Hennevin, Bernard, to Compagnie Electro-Mecanique. Equalizer circuit for switches connected in series. 4,555,754, Cl. 363-132.000.
Henschen, Agnes: *See*—
Brantl, Victor; Teschemacher, Hansjorg; Henschen, Agnes; and Lottspeich, Friedrich, 4,555,403, Cl. 514-17.000.
Henson, Donald E.: *See*—
Sack, Michael C.; Henson, Donald E.; and Sack, Russell M., 4,555,082, Cl. 248-220.100.
Hepburn, John J.: *See*—
Moran, David P. J.; Hepburn, John J.; and Sharp, David G., 4,555,411, Cl. 426-603.000.
Hepworth, Malcolm T.: *See*—
Sabacky, Bruce J.; and Hepworth, Malcolm T., 4,555,387, Cl. 423-59.000.
Hercules Incorporated: *See*—
Funk, Richard L., 4,555,279, Cl. 149-92.000.
Winston, Scott, 4,555,276, Cl. 149-6.000.
Hermann Wangner GmbH & Co.: *See*—
Borel, Georg; and Waldvogel, Hartmut, 4,554,953, Cl. 139-383.00A.
Herring, James M., Jr.: *See*—
Dickhart, William W., III; Graziani, Dante J., Jr.; Herring, James M., Jr.; Pavlick, Michael J.; and Renn, Edward J., 4,555,095, Cl. 267-4.000.
Heuer, Horst: *See*—
Droescher, Michael; Mumcu, Salih; Burzin, Klaus; Gerth, Christian; and Heuer, Horst, 4,555,550, Cl. 525-424.000.
Hewett, Gary E.; Atwood, Brian G.; and Wennberg, Timothy J., to Cetus Corporation. Multiple trough vessel for automated liquid handling apparatus. 4,554,839, Cl. 73-864.160.
Hewins, Doris J. Motor driven mini-wringer. 4,554,806, Cl. 68-257.000.
Hewitt, Edward G.; and Pasquale, William D., to New England Mfg. Co. Envelope. 4,555,026, Cl. 206-521.000.
Hewlett-Packard Company: *See*—
Jackson, Bruce J.; Simmons, Ralph F.; and Covault, Mike L., 4,555,740, Cl. 360-113.000.
You, Young S., 4,555,062, Cl. 239-690.000.
Heyman, Duane A., to BASF Wyandotte Corporation. Process for the preparation of acrylamide graft polymer dispersions. 4,555,527, Cl. 521-67.000.
Hiatt, Sidney A., to Leggett & Platt, Incorporated. Combination round coil spring and rectangular torsion coil spring assembly. 4,555,097, Cl. 267-100.000.
Hideaki Yamada: *See*—
Yamada, Hideaki; and Ryuno, Koitchiro, 4,555,487, Cl. 435-253.000.
Hill, James A.: *See*—
Burtch, John E.; and Hill, James A., 4,555,296, Cl. 156-446.000.
Hill, John B.: *See*—
Dryden, Hugh L., Jr; and Hill, John B., 4,555,362, Cl. 260-112.50R.
Hillenius, Steven J.; and Parrillo, Louis C., to AT&T Bell Laboratories. CMOS Integrated circuit technology utilizing dual implantation of slow and fast diffusing donor ions to form the n-well. 4,554,726, Cl. 29-571.000.
Hilliquist, Paul A. Convertible jacket. 4,554,682, Cl. 2-70.000.
Hilti Aktiengesellschaft: *See*—
Gassner, Theo; Hann, Bruno; and Kindle, Edwin, 4,554,861, Cl. 91-446.000.
Hilton, Allan R., to Hilton (Products) Limited. Workbenches. 4,555,099, Cl. 269-88.000.
Hilton (Products) Limited: *See*—
Hilton, Allan R., 4,555,099, Cl. 269-88.000.
Hiramatsu, Akira: *See*—
Suda, Yasuo; Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; and Ohtaka, Keiji, 4,555,169, Cl. 354-407.000.
Hirano, Fumiya: *See*—
Nishihata, Ken; Iinuma, Katsuharu; Yamada, Hitoshi; Hirano, Fumiya; and Tsuruoka, Takashi, 4,555,404, Cl. 514-201.000.
Hirano, Hideo; and Kimbara, Masahiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method of regulating warp yarn tension in a weaving machine. 4,554,951, Cl. 139-105.000.
Hirano, Masatoshi: *See*—
Kokubu, Sadao; Hirano, Masatoshi; and Sakakibara, Takao, 4,555,743, Cl. 361-196.000.
Hirayama, Noriaki: *See*—
Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, 4,555,402, Cl. 424-122.000.
Hirayama, Tsutomu: *See*—
Hada, Hiroshi; and Hirayama, Tsutomu, 4,555,641, Cl. 307-254.000.
Hirooka, Hiroshi; Yoshida, Yoshio; Fukushi, Toshio; Takeya, Yasuo; and Nagai, Satoshi, to Kaisha, Kentetsuco., Ltd. Agitating type washing machine. 4,554,805, Cl. 68-12.00R.
Hirose, Fumio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohara, Minoru; and Ando, Takao, 4,555,505, Cl. 514-42.000.
Hirose, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Image information filing apparatus and method. 4,555,803, Cl. 382-61.000.
Hirose, Yasuo: *See*—
Hasegawa, Toshiaki; and Hirose, Yasuo, 4,554,832, Cl. 73-432.00R.
Hiroyasu, Minoru; Yamashita, Hideo; Ohguro, Tamotsu; Yamagishi, Shigeru; and Shino, Shigenari, to Honda Giken Kogyo Kabushiki Kaisha. Reamer holding device for machining valve seats. 4,555,205, Cl. 408-150.000.
Hirschmanner, Franz; Buchegger, Rudolf; and Brettbacher, Franz, to Voest-Alpine Aktiengesellschaft. Heat shield for a rolling mill. 4,554,812, Cl. 72-202.000.
Hitachi, Ltd.: *See*—
Aoyama, Takanobu, 4,555,603, Cl. 200-144.0AP.
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, 4,555,224, Cl. 418-55.000.
Kahara, Toshiki; Mori, Toshikatsu; Imahashi, Jinichi; Honji, Akio; and Tamura, Kohki, 4,555,452, Cl. 429-13.000.
Kanehori, Keiichi; Miyauchi, Katsuki; Ito, Yukio; Kirino, Fumiyoshi; and Kudo, Tetsuichi, 4,555,456, Cl. 429-131.000.
Kotera, Nobuo; Hatano, Yuji; Asano, Atsushi; and Kawabe, Ushio, 4,555,643, Cl. 307-476.000.
Matsushita, Yasuo; Nakamura, Kousuke; and Harada, Koji, 4,555,358, Cl. 252-516.000.
Matsuura, Shigeo; Ito, Uji; and Yakushiji, Yasuhiro, 4,555,702, Cl. 340-825.640.
Nishikawa, Mitsuyo; and Kurihara, Nobuo, 4,555,800, Cl. 382-25.000.
Tanaka, Isamu; Kikuchi, Hiroshi; Tomizawa, Akira; and Oka, Hitoshi, 4,555,532, Cl. 523-400.000.
Tanimura, Nobuyoshi; and Yasui, Tokumasa, 4,554,729, Cl. 29-577.00C.
Hitomi, Yasuhiro, to Shimano Industrial Company Limited. Drag mechanism for a spinning reel. 4,555,072, Cl. 242-84.50R.
Hoburg, James F.: *See*—
Prinz, Friedrich B.; Hoburg, James F.; and Gunnarsson, Kristjan, 4,554,834, Cl. 73-597.000.
Hochiki Kabushiki Kaisha: *See*—
Machida, Haruchika; and Yuchi, Sadataka, 4,555,695, Cl. 340-538.000.
Hoechst Aktiengesellschaft: *See*—
Erdmann, Fritz; and Simon, Ulrich, 4,555,469, Cl. 430-168.000.
Hunger, Klaus, 4,555,568, Cl. 534-801.000.
Hoefke, Wolfgang: *See*—
Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, 4,555,511, Cl. 514-301.000.
Hofmeister, Helmut: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,555,507, Cl. 514-172.000.

Hogge, Charles R., Jr., to Rockwell International Corporation. Equalizer circuit suitable for adaptive use with fiber optics. 4,555,789, Cl. 375-11.000.
Hohki, Tetsuo: *See*—
Masuda, Tatsunosuke; Hohki, Tetsuo; and Kurusu, Yasuo, 4,555,180, Cl. 356-445.000.
Hokama, Yosh, to International Beauty Distributors, Inc. Artificial fingernail with holes to receive liquid adhesive. 4,554,935, Cl. 132-73.000.
Holle, Wilhelm: *See*—
Ziemer, Wolf; and Holle, Wilhelm, 4,554,766, Cl. 52-28.000.
Holoch, Klaus: *See*—
Barzynski, Helmut; and Holoch, Klaus, 4,555,471, Cl. 430-273.000.
Holz, Joachim; Meier, Wolfgang; Schwarting, Karl-Heinz; Goris, Heinrich; and Ogorek, Kurt, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Supply of liquid media for a hydraulic-mechanically operating mine working machine with sword. 4,555,142, Cl. 299-43.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hiroyasu, Minoru; Yamashita, Hideo; Ohguro, Tamotsu; Yamagishi, Shigeru; and Shino, Shigenari, 4,555,205, Cl. 408-150.000.
Hosaka, Takefumi; Imai, Takeshi; and Senzaki, Takaya, 4,555,691, Cl. 340-52.00R.
Kamiya, Tadashi; and Hayashi, Kiyotaka, 4,554,990, Cl. 180-197.000.
Munakata, Shunsaku; Ukai, Hitoshi; Noguchi, Mitsuru; and Sawai, Shinichi, 4,555,380, Cl. 264-510.000.
Oike, Ikuo, 4,554,785, Cl. 60-314.000.
Takeuchi, Hiroo; and Miyazaki, Kazuo, 4,554,786, Cl. 60-397.000.
Umeno, Hiroshi; Saito, Gunji; and Hayashida, Morimasa, 4,554,780, Cl. 56-11.800.
Honji, Akio: *See*—
Kahara, Toshiki; Mori, Toshikatsu; Imahashi, Jinichi; Honji, Akio; and Tamura, Kohki, 4,555,452, Cl. 429-13.000.
Hoover Company, The: *See*—
Rennecker, David B.; and Taylor, Walt S., 4,554,698, Cl. 15-339.000.
Hoover, Merwin F.; Salamone, Ann B.; and Vandebult, Jan, to Polyonics Corporation. Process for producing composite product having patterned metal layer. 4,555,414, Cl. 427-43.100.
Hor, Ah-Mee; and Loutfy, Rafik O., to Xerox Corporation. Photoresponsive imaging members with chloroindium phthalocyanine compositions. 4,555,463, Cl. 430-59.000.
Horie, Shin'ichi; Matsuzaki, Yutaka; and Kagawa, Fumio, to Showa Denko Kabushiki Kaisha. Grinding sheet and process for preparing same. 4,555,250, Cl. 51-309.000.
Horodysky, Andrew G.; and Landis, Phillip S., to Mobil Oil Corporation. Borated phosphonates as lubricant and fuel additives. 4,555,353, Cl. 252-49.600.
Horvath, Zoltan: *See*—
Muggli, Jurg; Guttinger, Heinz; and Horvath, Zoltan, 4,555,634, Cl. 250-565.000.
Hosaka, Takefumi; Imai, Takeshi; and Senzaki, Takaya, to Honda Giken Kogyo Kabushiki Kaisha. Shift indicating system for speed change gears of a manual transmission. 4,555,691, Cl. 340-52.00R.
Hosokawa, Yasuhiko: *See*—
Matsumura, Susumu; Hosokawa, Yasuhiko; Katsuki, Kanji; and Yano, Masao, 4,555,750, Cl. 363-37.000.
Houdayer, Bernard; Le Fur, Bernard; Meneghin, Rene ; and Moniod, Jean-Michel, to Cebal. Method of fitting a metal closure. 4,555,208, Cl. 413-2.000.
Houng, Huang-Kiang. Inflight headset for civil aircraft. 4,554,993, Cl. 181-130.000.
Houston, Timothy L.: *See*—
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Houston, Timothy L., 4,555,263, Cl. 71-98.000.
Houze, Eric C.: *See*—
Bednarek, Milan B.; and Houze, Eric C., 4,555,535, Cl. 524-40.000.
Howard, Kenneth G.; and Little, Ian E., to Standard Telephones and Cables Public Limited Company. Optical fibre pulling tower. 4,555,257, Cl. 65-13.000.
Hsiao, Charles H., to Key Pharmaceuticals, Inc. Aspirin tablet. 4,555,399, Cl. 424-35.000.
Hsu, Jeng-Hsiung. Seating device for fishing reel. 4,554,755, Cl. 43-22.000.
Hsu, Li-Chen. Ring-chain polymer containing triaryl-s-triazine ring and other heat-resistant heterocyclic rings. 4,555,565, Cl. 528-322.000.
Huang, Tung M.: *See*—
Arway, George; Eremity, Frank; and Huang, Tung M., 4,555,719, Cl. 346-140.00R.
Huber, Philippe: *See*—
Hausler, Michael; Huber, Philippe; Pfyl, Walter; and Sadek, Kadry, 4,555,658, Cl. 323-210.000.
Hubert, Claudette, to CX Packaging Inc. Musical pacifier. 4,554,919, Cl. 128-360.000.
Hubert, Gunter: *See*—
Finkenzeller, Johann; and Hubert, Gunter, 4,555,794, Cl. 378-187.000.
Huck Manufacturing Company: *See*—
Paus, Lloyd L., 4,554,838, Cl. 73-761.000.
Huckenbeck, Claus O., to Bausch & Lomb Incorporated. Switch assembly for riflescope. 4,554,744, Cl. 33-241.000.
Huckfeldt, Gebhard: *See*—
Gregor, Barbara; and Huckfeldt, Gebhard, 4,555,408, Cl. 426-90.000.
Huckfeldt & Thorlichen: *See*—
Gregor, Barbara; and Huckfeldt, Gebhard, 4,555,408, Cl. 426-90.000.
Hughes, Robert S., to R. S. Hughes Ind. Inc. Nurse's seat. 4,555,138, Cl. 297-346.000.
Hughes Tool Company: *See*—
Davies, David L., 4,554,981, Cl. 175-4.520.
Huhn, Karl; and von Au, Gunter, to Wacker-Chemie GmbH. Method of impregnating textile materials made from organic fibers. 4,555,419, Cl. 427-387.000.
Huijsing, Johan H.; and van de Plassche, Rudy J., to Signetics Corporation. Differential amplifier with rail-to-rail input capability and controlled transconductance. 4,555,673, Cl. 330-258.000.
Hull, Robert; and Lane, Joseph A., to Amtrol, Inc. Gas-liquid vortex separator-eliminator. 4,555,253, Cl. 55-170.000.
Humes, Dennis W.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; and Stanley, Mervin D., 4,554,944, Cl. 137-296.000.
Hundebol, Soren, to F. L. Smidth & Co. A/S. Method and apparatus for calcining raw phosphate material. 4,555,388, Cl. 423-167.000.
Hunger, Klaus, to Hoechst Aktiengesellschaft. Monoazo compounds derived from 3-nitro-4-amino-benzoates and 5-(2'-hydroxy-3'-naphthoylamino)-benzimidazolones. 4,555,568, Cl. 534-801.000.
Hunt Manufacturing Co.: *See*—
Turnbull, Clyde D., 4,555,150, Cl. 312-250.000.
Hurley, James E.: *See*—
Thomas, Calvin J.; and Hurley, James E., 4,555,606, Cl. 219-10.55R.
Hwang, Eddie Y.; Szabo, Andras I.; and Shung, Wu-shi, to Westinghouse Electric Corp. Turbine valve control system. 4,554,788, Cl. 60-646.000.
Hydril Company: *See*—
Burton, James A., 4,554,982, Cl. 175-75.000.
Hynes, Joseph H.; Morrill, Charles D.; and Hall, George D., 4,554,976, Cl. 166-341.000.
Hynes, Joseph H.; Morrill, Charles D.; and Hall, George D., to Hydril Company. Test tool for subsea blowout preventer stack. 4,554,976, Cl. 166-341.000.
Ibe, Satoshi: *See*—
Awano, Koichi; Nitta, Yoshifumi; and Ibe, Satoshi, 4,554,964, Cl. 165-39.000.
Ibigawa Electric Industry Company, Ltd.: *See*—
Yasuda, Haruo; Yoshida, Kunihiko; Iwai, Yasuro; and Mizutani, Takayuki, 4,555,615, Cl. 219-145.210.
Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Compressor oil return system for refrigeration apparatus and method. 4,554,795, Cl. 62-175.000.
Ichikoh Industries Limited: *See*—
Enomoto, Masao, 4,555,166, Cl. 350-634.000.
ICI Australia Limited: *See*—
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Houston, Timothy L., 4,555,263, Cl. 71-98.000.
Ideal Standard S.p.A.: *See*—
Biadigo, Mario; and Zucchi, Gianfranco, 4,555,229, Cl. 425-267.000.
Idenden, Frederick W.: *See*—
Friedes, Albert; Greene, Thomas V.; Idenden, Frederick W.; Moeller, Kenneth L.; Musen, Robert M.; and O'Hara, John F., Jr., 4,555,594, Cl. 179-18.00B.
Iida, Takao: *See*—
Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, 4,555,402, Cl. 424-122.000.
Iida, Yoshikazu; and Hagyuda, Nobuyoshi, to Nippon Kogaku K.K. Electronic flash unit utilizing pre-flash illumination of flashtube. 4,555,648, Cl. 315-241.00P.
Iijima, Toshio: *See*—
Kido, Keishiro; Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,555,464, Cl. 430-67.000.
Iinuma, Katsuharu: *See*—
Nishihata, Ken; Iinuma, Katsuharu; Yamada, Hitoshi; Hirano, Fumiya; and Tsuruoka, Takashi, 4,555,404, Cl. 514-201.000.
Ikenaga, Yukio: *See*—
Kausga, Takuzo; Ikenaga, Yukio; and Suzuki, Kunio, 4,555,357, Cl. 252-511.000.
Ikonomou, Aristarchos S. Earthquake guarding system. 4,554,767, Cl. 52-167.000.
Ikuta, Hiroyuki: *See*—
Hayashi, Takehiko; Ikuta, Hiroyuki; and Ohta, Takanori, 4,554,811, Cl. 72-110.000.
Ikuzawa, Masanori: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohara, Minoru; and Ando, Takao, 4,555,505, Cl. 514-42.000.
Illirrie Holdings Pty Ltd.: *See*—
Lane, Leonard A., 4,554,881, Cl. 114-39.000.
Imahashi, Jinichi: *See*—
Kahara, Toshiki; Mori, Toshikatsu; Imahashi, Jinichi; Honji, Akio; and Tamura, Kohki, 4,555,452, Cl. 429-13.000.
Imai, Masaya: *See*—
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, 4,555,224, Cl. 418-55.000.

Imai, Takeshi: *See—*
Hosaka, Takefumi; Imai, Takeshi; and Senzaki, Takaya, 4,555,691, Cl. 340-52.00R.

Imperial Chemical Industries, plc: *See—*
Cartwright, David, 4,555,575, Cl. 546-345.000.

Imperial Clevite Inc.: *See—*
Adams, Kenneth J.; and Dyke, David E., 4,555,294, Cl. 156-309.600.
Shtarkman, Emile M., 4,555,098, Cl. 267-140.100.

Ina Seito Co., Ltd.: *See—*
Fujii, Morizumi; Kakimoto, Hirofumi; and Fujino, Shinji, 4,554,769, Cl. 52-173.00R.

Inaba, Hajimu; and Sakakibara, Shinsuke, to Fanuc Ltd. Method and apparatus for controlling the acceleration and deceleration of a movable element without abrupt changes in motion. 4,555,758, Cl. 364-174.000.

Inagaki, Yasuhiro: *See—*
Fukuju, Osamu; Inagaki, Yasuhiro; and Minoshima, Katsuji, 4,555,104, Cl. 271-228.000.

Inagaki, Yoshio: *See—*
Sakai, Nobuo; Okazaki, Masaki; and Inagaki, Yoshio, 4,555,479, Cl. 430-372.000.

Inco Alloys International, Inc.: *See—*
Hall, Dale E., 4,555,413, Cl. 427-34.000.

Ingersoll-Rand Company: *See—*
Hakes, Gary A., 4,554,984, Cl. 175-170.000.

Inoue, Noriyuki; Okazaki, Masaki; Yamamuro, Kiyohiko; and Takei, Haruo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,555,482, Cl. 430-574.000.

Intelledex Incorporated: *See—*
Wright, Allen J., 4,555,217, Cl. 414-735.000.

Intermedics, Inc.: *See—*
Baker, Ross G., Jr.; and Calfee, Richard V., 4,554,920, Cl. 128-419.0PG.

Intermountain Research & Development Corporation: *See—*
Cyran, Michael J.; and Wang, Kuei-Hsiung, 4,555,391, Cl. 423-244.000.

International Beauty Distributors, Inc.: *See—*
Hokama, Yosh, 4,554,935, Cl. 132-73.000.

International Business Machines Corporation: *See—*
Bansal, Jai P.; Bertin, Claude L.; and Troutman, Ronald R., 4,555,721, Cl. 357-42.000.
Carter, Eric L.; and Ward, Harold T., 4,555,769, Cl. 364-746.000.
Case, William R.; and Johnson, Wildey E., 4,555,767, Cl. 364-563.000.
Chance, Dudley A.; Reiley, Timothy C.; and Sampogna, Michael, 4,555,285, Cl. 156-89.000.
Convis, Danny B.; Crehan, Donald T.; and Lovell, Charles J., 4,555,700, Cl. 340-721.000.
Dahl, Richard E.; Faflak, Daniel P.; and Sendelbach, Lee A., 4,555,701, Cl. 340-736.000.
Fedak, John F.; Findley, Gerald I.; and Torr, Terry A., 4,555,802, Cl. 382-56.000.
Karnes, Roy E., Jr.; McCaskill, Rex A.; and Nguyen, Khoa D., 4,555,773, Cl. 364-900.000.
Le Van, Dien; and Wallace, Jesse T., 4,555,739, Cl. 360-103.000.
Masenas, Charles J., Jr., 4,555,776, Cl. 365-202.000.
McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., 4,555,759, Cl. 364-300.000.
Shepard, Joseph F., 4,554,728, Cl. 29-576.00W.
Stephens, Lawrence K., 4,555,772, Cl. 364-900.000.

International Coal Refining Company: *See—*
Bronfenbrenner, James C.; Foster, Edward P.; and Tewari, Krishna, 4,555,248, Cl. 44-78.000.

International Standard Electric Corporation: *See—*
Blomley, Peter F., 4,555,596, Cl. 179-81.00B.
Bossennec, Jean-Louis G.; Debuisser, Jean-Claude A.; and Farhi, Philippe F., 4,555,705, Cl. 343-55.00A.

International Telephone and Telegraph Corporation: *See—*
Argentieri, Michael A., 4,555,587, Cl. 174-11.00R.
Casilli, Joseph C., 4,555,222, Cl. 417-393.000.
Sugars, John A., 4,555,154, Cl. 339-59.00R.

Invacare Corporation: *See—*
Lockard, Walter G.; Patel, Nathalal G.; and Boris, Allen J., 4,555,121, Cl. 280-30.000.

Iowa State University Research Foundation, Inc.: *See—*
Kuehn, Thomas H., 4,555,764, Cl. 364-557.000.
Spurlin, Stanford R.; and Yeung, Edward S., 4,555,491, Cl. 436-120.000.

Irvine, Michael D., to ACD, Inc. High speed turbogenerator for power recovery from fluid flow within conduit. 4,555,637, Cl. 290-52.000.

Irvine Sensors Corporation: *See—*
Bridgewater, Walter F.; De Caro, Robert E.; Larson, Roger; and Wall, Llewellyn E., 4,555,623, Cl. 250-214.00A.

Irwin, Dennis V. Portable shelter. 4,554,937, Cl. 135-100.000.

Iseki, Masahide; Yoshiyama, Toshio; Kajita, Hiroshi; Itakiyo, Masanori; Kusumoto, Hiroshi; Kawamori, Yoshizo; and Kawamoto, Masuo, to Mita Industrial Co., Ltd. Electrostatic copying apparatus. 4,555,173, Cl. 355-3.00R.

Ishibashi, Masashi: *See—*
Nakamura, Koichi; Ishibashi, Masashi; Kameda, Hideki; and Makiyo, Minoru, 4,555,422, Cl. 428-36.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Awano, Koichi; Nitta, Yoshifumi; and Ibe, Satoshi, 4,554,964, Cl. 165-39.000.

Ishima, Kazumi, to Ricoh Company, Ltd. Power source device for ink jet printer. 4,555,713, Cl. 346-75.000.

Ishimitsu, Ikuo; Tokunaga, Toshimichi; Tanaka, Takeshi; and Anan, Yoshiaki, to Mazda Motor Corporation. Vehicle suspension system. 4,555,126, Cl. 280-707.000.

Ishizaki, Akira: *See—*
Suda, Yasuo; Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; and Ohtaka, Keiji, 4,555,169, Cl. 354-407.000.

Islet, Peter: *See—*
Lange, Wolf-Ruediger; Wessel, Anton; Bohler, Udo; Volkheimer, Klaus; Greiner, Gunter; and Islet, Peter, 4,555,806, Cl. 455-62.000.

Itakiyo, Masanori: *See—*
Iseki, Masahide; Yoshiyama, Toshio; Kajita, Hiroshi; Itakiyo, Masanori; Kusumoto, Hiroshi; Kawamori, Yoshizo; and Kawamoto, Masuo, 4,555,173, Cl. 355-3.00R.

Itek Corporation: *See—*
Aldrich, Ralph E.; and Daigneault, Steven M., 4,555,162, Cl. 350-162.170.

Ito, Uji: *See—*
Matsuura, Shigeo; Ito, Uji; and Yakushiji, Yasuhiro, 4,555,702, Cl. 340-825.640.

Ito, Yukio: *See—*
Kanehori, Keiichi; Miyauchi, Katsuki; Ito, Yukio; Kirino, Fumiyoshi; and Kudo, Tetsuichi, 4,555,456, Cl. 429-131.000.

ITS-Intern Transport System A/S: *See—*
Solund, Jorgen, 4,555,010, Cl. 198-361.000.

ITT Corporation: *See—*
Merrill, Dana A., 4,555,788, Cl. 375-11.000.

ITT Industries, Inc.: *See—*
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,555,144, Cl. 303-92.000.
Budecker, Ludwig; and Obersteiner, Georg, 4,555,223, Cl. 417-462.000.

Iwahashi, Kazuyuki: *See—*
Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, 4,555,402, Cl. 424-122.000.

Iwai, Yasuro: *See—*
Yasuda, Haruo; Yoshida, Kunihiko; Iwai, Yasuro; and Mizutani, Takayuki, 4,555,615, Cl. 219-145.210.

Izhar, Rafi: *See—*
Nun, Emmanuel B.; Izhar, Rafi; and Karpol, Avner, 4,555,727, Cl. 358-106.000.

J.F.S., Inc.: *See—*
Johnson, David A., 4,555,051, Cl. 224-150.000.

J. M. Voith GmbH: *See—*
Steiner, Karl; Schiel, Christian; Meinecke, Albrecht; Mullner, Josef; and Weiss, Hans, 4,555,305, Cl. 162-205.000.

Jablonka, Dieter; Urban, Klaus; Raidt, Heinz-Peter; and Schepers, Eberhard, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.; and Ewald Dorken AG. Sound-absorbing element. 4,555,433, Cl. 428-166.000.

Jackson, Bruce J.; Simmons, Ralph F.; and Covault, Mike L., to Hewlett-Packard Company. Thin film transducer head for inductive recording and magnetoresistive reading. 4,555,740, Cl. 360-113.000.

Jackson, David L. Drawer slide mounting bracket. 4,555,147, Cl. 308-3.800.

Jacobsen, Jan: *See—*
Meier, Walter; and Jacobsen, Jan, 4,555,168, Cl. 353-7.000.

Jacobson, Dale C.: *See—*
Gibson, John M.; Jacobson, Dale C.; Poate, John M.; and Tung, Raymond T., 4,555,301, Cl. 156-617.00R.

Jacobson, Felix I.: *See—*
Agapiou, Agapios; Allan, John L. H.; and Jacobson, Felix I., 4,555,496, Cl. 502-105.000.

Jain, Gyan P., to Phillips Petroleum Company. Control of a fractional distillation process. 4,555,309, Cl. 203-1.000.

James River-Norwalk, Inc.: *See—*
Brown, Richard K.; and Seiferth, Oscar E., 4,555,605, Cl. 219-10.55E.

Jamsa, Hannu, to Satoturve Oy. Apparatus for collecting peat from a peat field. 4,554,750, Cl. 37-3.000.

Janome Sewing Machine Industry Co. Ltd.: *See—*
Eguchi, Yasukata, 4,554,879, Cl. 112-445.000.
Kongoh, Takeshi, 4,554,880, Cl. 112-454.000.

Japan: *See—*
Nemoto, Akira, 4,555,140, Cl. 297-452.000.

Jarrett, Robert B.: *See—*
Gray, Randall C.; and Jarrett, Robert B., 4,555,742, Cl. 361-93.000.

Jeans, Edward L., to Cadbury Schweppes, Plc. Carbonator for a beverage dispenser. 4,555,371, Cl. 261-122.000.

Jeffery, Philip A. E.; and Luecke, Greg R., to United Technologies Corporation. Hub-mounted actuators for blade pitch collective control. 4,555,219, Cl. 416-158.000.

Jenkins, Donald, to Astoria Fibra-Steel, Inc. Gasket-sealed molded door and framing member therefor. 4,554,764, Cl. 49-501.000.

Jensen Corporation: *See—*
Bosshart, John; and Allen, William W., 4,554,752, Cl. 38-61.000.

Jeumont-Schneider Corporation: *See—*
Brulard, Michel C., 4,555,652, Cl. 318-375.000.
Gabillet, Jean-Francois, 4,555,791, Cl. 375-58.000.

JFEC Corporation & Associates: *See—*
Foster, James O., 4,555,057, Cl. 236-94.000.

Johansson, Borje; Pramskog, Torbjorn; and Sandberg, Jan-Erik, to Forenade Fabriksverken. Pressure damper for recoilless weapons. 4,554,860, Cl. 89-1.700.

Johansson, Gustav A., to Danfoss A/S. Apparatus for conveying liquids. 4,554,791, Cl. 62-55.000.

John Fluke Mfg. Co., Inc.: *See*—
Eng, Benjamin, Jr.; Duryee, Peter S.; and Anholm, John M., Jr., 4,555,692, Cl. 340-347.0AD.

Johnsen & Jorgensen (Plastics) Limited: *See*—
Davis, Eugene E., 4,555,035, Cl. 215-215.000.

Johnson, Anthony M.: *See*—
Glass, Alastair M.; Johnson, Anthony M.; and Liao, Paul F., 4,555,622, Cl. 250-211.00J.

Johnson, David A., to J.F.S., Inc. Sling for shoulder weapon. 4,555,051, Cl. 224-150.000.

Johnson, Donald L.; and Lingenfelter, Lowell R., to Teledyne Industries, Inc. Leadless integrated circuit connector. 4,555,152, Cl. 339-17.00L.

Johnson, Donald L.; and Kordis, Thomas F., to Teledyne Industries, Inc. Electrical connector for visual display and method of making same. 4,555,157, Cl. 339-75.0MP.

Johnson Fishing, Inc.: *See*—
Klammer, Mark S.; and Decko, Del P., 4,555,233, Cl. 440-56.000.

Johnson, Richard C.; and Egbert, Leigh B., to Foster Wheeler Energy Corporation. Erosion resistant waterwall. 4,554,967, Cl. 165-134.100.

Johnson, Wildey E.: *See*—
Case, William R.; and Johnson, Wildey E., 4,555,767, Cl. 364-563.000.

Johnson, Wilfred B. Twin piston-per-cylinder engine. 4,554,894, Cl. 123-53.0AA.

Jones, Cameron W.: *See*—
Alonso, Sydney A.; and Jones, Cameron W., 4,554,855, Cl. 84-122.000.

Jones, Harry P., to Burroughs Wellcome Co. Inclusion complex of β-cyclodextrin and digoxin. 4,555,504, Cl. 514-26.000.

Jones, Howard: *See*—
Suh, John T.; Regan, John R.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,555,508, Cl. 514-211.000.

Jones, Kenneth W., to Reed Rock Bit Company. Rotary drill bit having drag cutting elements. 4,554,986, Cl. 175-397.000.

Jones, Robert C. Apparatus for rupturing carrier bags. 4,555,212, Cl. 414-412.000.

Jones, William E.: *See*—
Fights, Michael L.; and Jones, William E., 4,555,416, Cl. 427-248.100.

Jonsson, Arne; Nyman, Sigurd; Olelind, Eskil K.; and Olofsson, Bjorn, to Jonsson Pumpkonsult. Turbo machine of the rotodynamic type. 4,555,218, Cl. 416-17.000.

Jonsson, Ernst U.; Lindqvist, Sten-Borje; and Wimmerstedt, Roland V., to Gambro Lundia AB. Process for the separation of gaseous mixtures used in sterilization processes. 4,555,251, Cl. 55-48.000.

Jonsson Pumpkonsult: *See*—
Jonsson, Arne; Nyman, Sigurd; Olelind, Eskil K.; and Olofsson, Bjorn, 4,555,218, Cl. 416-17.000.

Joos, Heinz: *See*—
Krenkel, Bernhard; and Joos, Heinz, 4,554,954, Cl. 139-439.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Rupprechter, Helmut, 4,554,706, Cl. 16-237.000.

Jung, Friedrich: *See*—
Kiesewetter, Holger; Jung, Friedrich; and Roggenkamp, Hans-Gunther, 4,554,821, Cl. 73-55.000.

Junglen, Mark T.: *See*—
Goodwin, Alton' C.; Junglen, Mark T.; and Kent, John S., 4,554,963, Cl. 165-1.000.

Jurus, Kevin D., to Motor Wheel Corporation. Draw-spinning of integral vehicle wheel rim and disc segments. 4,554,810, Cl. 72-70.a00.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Nagano, Tamio, 4,555,008, Cl. 192-106.100.

Kabushiki Kaisha Daisei Kikai: *See*—
Chikatani, Hajime, 4,554,776, Cl. 53-76.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Asano, Juichi; Okubo, Yasuo; Saito, Hiroshi; and Harada, Shigeru, 4,555,064, Cl. 241-89.300.
Baba, Kiyokazu; and Nishida, Kenji, 4,555,012, Cl. 198-621.000.
Tamura, Yukio; and Kaminishi, Masashi, 4,555,146, Cl. 305-10.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Fukushima, Yoneharu; and Wakai, Kiyoshi, 4,555,690, Cl. 340-52.00F.

Kabushiki Kaisha Sunpak: *See*—
Tsuruta, Yuzo, 4,555,747, Cl. 362-3.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kokubu, Sadao; Hirano, Masatoshi; and Sakakibara, Takao, 4,555,743, Cl. 361-196.000.

Kabushiki Kaisha Toshiba: *See*—
Kurosawa, Ryoichi, 4,555,752, Cl. 363-68.000.
Nakagome, Hideki; and Yasuda, Satoshi, 4,554,790, Cl. 62-3.000.
Sakurai, Takayasu, 4,555,778, Cl. 365-230.000.
Tanaka, Tatsuo, 4,555,670, Cl. 330-252.000.
Ueno, Mitsushi; Shirogami, Tamotsu; and Mikogami, Yukihiro, 4,555,324, Cl. 204-284.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Hirano, Hideo; and Kimbara, Masahiko, 4,554,951, Cl. 139-105.000.

Kagawa, Fumio: *See*—
Horie, Shin'ichi; Matsuzaki, Yutaka; and Kagawa, Fumio, 4,555,250, Cl. 51-309.000.

Kahara, Toshiki; Mori, Toshikatsu; Imahashi, Jinichi; Honji, Akio; and Tamura, Kohki, to Hitachi, Ltd. Method for operating fuel cell. 4,555,452, Cl. 429-13.000.

Kaisha, Kentetsuco., Ltd.: *See*—
Hirooka, Hiroshi; Yoshida, Yoshio; Fukushi, Toshio; Takeya, Yasuo; and Nagai, Satoshi, 4,554,805, Cl. 68-12.00R.

Kajita, Hiroshi: *See*—
Iseki, Masahide; Yoshiyama, Toshio; Kajita, Hiroshi; Itakiyo, Masanori; Kusumoto, Hiroshi; Kawamori, Yoshizo; and Kawamoto, Masuo, 4,555,173, Cl. 355-3.00R.

Kakimoto, Hirofumi: *See*—
Fujii, Morizumi; Kakimoto, Hirofumi; and Fujino, Shinji, 4,554,769, Cl. 52-173.00R.

Kalpakci, Bayram; and Chan, Keng S., to Standard Oil Company, The. Method of enhanced oil recovery employing thickened amphoteric surfactant solutions. 4,554,974, Cl. 166-273.000.

Kamaike, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus for A.C. elevator. 4,554,999, Cl. 187-29.00R.

Kameda, Hideki: *See*—
Nakamura, Koichi; Ishibashi, Masashi; Kameda, Hideki; and Makiyo, Minoru, 4,555,422, Cl. 428-36.000.

Kamienski, Conrad W., to Lithium Corporation of America. Preparation of certain alkaline earth metal organometallic compounds. 4,555,498, Cl. 502-153.000.

Kaminishi, Masashi: *See*—
Tamura, Yukio; and Kaminishi, Masashi, 4,555,146, Cl. 305-10.000.

Kamiya, Tadashi; and Hayashi, Kiyotaka, to Honda Giken Kogyo Kabushiki Kaisha. Anti-slip system for wheeled vehicle. 4,554,990, Cl. 180-197.000.

Kamp, Heinz, to W. Schlafhorst & Co. Method for calling a bobbin-changing device. 4,555,068, Cl. 242-36.000.

Kanbe, Junichiro: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,555,465, Cl. 430-95.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Toyooka, Eietsu; Tomishima, Yoshio; and Nojima, Yasuhiro, 4,555,555, Cl. 526-62.000.

Kanehori, Keiichi; Miyauchi, Katsuki; Ito, Yukio; Kirino, Fumiyoshi; and Kudo, Tetsuichi, to Hitachi, Ltd. Cathode structure for thin film battery. 4,555,456, Cl. 429-131.000.

Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., to Ortho Pharmaceutical Corporation. Substituted 4-alkyl-2-(1H) quinazolinone-1-alkanoic acid derivatives. 4,555,570, Cl. 544-286.000.

Kao Soap Co., Ltd.: *See*—
Fukumoto, Yasuhisa; and Moriyama, Noboru, 4,555,557, Cl. 526-240.000.

Kapp, John P.; and Smith, Robert R. Prosthetic vertebral body. 4,554,914, Cl. 128-92.00C.

Karanewsky, Donald S.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Phosphorus containing compounds and use as hypotensives. 4,555,506, Cl. 514-91.000.

Karanewsky, Donald S.: *See*—
Misra, Raj N.; and Karanewsky, Donald S., 4,555,520, Cl. 514-346.000.

Karklin, Roland: *See*—
Whiteside, Robert C.; Arends, Albert W.; and Karklin, Roland, 4,555,377, Cl. 264-292.000.

Karnes, Roy E., Jr.; McCaskill, Rex A.; and Nguyen, Khoa D., to International Business Machines Corporation. Printing with a data stream including merged graphic and alphanumeric data. 4,555,773, Cl. 364-900.000.

Karpol, Avner: *See*—
Nun, Emmanuel B.; Izhar, Rafi; and Karpol, Avner, 4,555,727, Cl. 358-106.000.

Karsten Solheim: *See*—
Valehrach, Emil M., 4,555,028, Cl. 209-599.000.

Kasai, Kunio: *See*—
Esaki, Hiroshi, 4,554,856, Cl. 84-95.00C.

Kasai, Yoshihiko: *See*—
Gounji, Takashi; Kawatsu, Teruo; Kasai, Yoshihiko; and Takeuchi, Chikao, 4,555,682, Cl. 333-189.000.

Kase, Hiroshi: *See*—
Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, 4,555,402, Cl. 424-122.000.

Kassai, Denes P., to FMC Corporation. Hydraulically operated four wheel sweeper. 4,554,992, Cl. 180-307.000.

Katagiri, Kazuharu; and Oguchi, Yoshihiro, to Canon Kabushiki Kaisha. Organic coating film and radiation-sensitive member having the film. 4,555,472, Cl. 430-278.000.

Kato, Hidetoshi; Maruyama, Toshinori; Matsuhashi, Hajime; and Akita, Yoshio, to Nippondenso Co., Ltd. Voltage regulator for alternator of vehicle. 4,555,657, Cl. 320-64.000.

Kato, Mitsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic rhythm performing apparatus. 4,554,854, Cl. 84-1.030.

Kato, Shigeru: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; Kiuchi, Tsutomu; and Kitamura, Hiroki, 4,555,714, Cl. 346-76.0PH.

Katoh, Mitsumi: *See*—
Wachi, Masatada; and Katoh, Mitsumi, 4,554,858, Cl. 84-1.190.

Katsuki, Kanji: *See*—
Matsumura, Susumu; Hosokawa, Yasuhiko; Katsuki, Kanji; and Yano, Masao, 4,555,750, Cl. 363-37.000.

Katsuyama, Hitoshi, to Pioneer Video Corporation. Detection circuit for detecting synchronous and asynchronous states in a phase-locked loop circuit. 4,555,679, Cl. 331-17.000.

Kausga, Takuzo; Ikenaga, Yukio; and Suzuki, Kunio, to Polyplastics Company, Ltd. Polyacetal resin composition. 4,555,357, Cl. 252-511.000.

Kawabe, Toshihiko: *See—*
Amemori, Koichi; and Kawabe, Toshihiko, 4,554,892, Cl. 123-41.82R.

Kawabe, Ushio: *See—*
Kotera, Nobuo; Hatano, Yuji; Asano, Atsushi; and Kawabe, Ushio, 4,555,643, Cl. 307-476.000.

Kawada, Yasuyuki: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,555,351, Cl. 252-8.55D.

Kawaguchiko Seimitsu Company Limited: *See—*
Yokoyama, Eisuke, 4,554,783, Cl. 59-82.000.

Kawai, Osamu; and Ono, Katsuyasu, to NSK-Warner K.K. Webbing retractor. 4,555,074, Cl. 242-107.40A.

Kawai, Osamu, to NSK-Warner K.K. Passive seat belt system. 4,555,127, Cl. 280-806.000.

Kawajiri, Kazuhiro: *See—*
Kido, Keishiro; Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,555,464, Cl. 430-67.000.

Kawamori, Yoshizo: *See—*
Iseki, Masahide; Yoshiyama, Toshio; Kajita, Hiroshi; Itakiyo, Masanori; Kusumoto, Hiroshi; Kawamori, Yoshizo; and Kawamoto, Masuo, 4,555,173, Cl. 355-3.00R.

Kawamoto, Masuo: *See—*
Iseki, Masahide; Yoshiyama, Toshio; Kajita, Hiroshi; Itakiyo, Masanori; Kusumoto, Hiroshi; Kawamori, Yoshizo; and Kawamoto, Masuo, 4,555,173, Cl. 355-3.00R.

Kawamura, Kouichi; Aotani, Yoshimasa; and Umehara, Akira, to Fuji Photo Film Co., Ltd. Photopolymerizable composition. 4,555,474, Cl. 430-281.000.

Kawamura, Takahide: *See—*
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, 4,555,006, Cl. 192-0.084.

Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, to Dai Nippon Insatsu Kabushiki Kaisha. Heat transferable sheet. 4,555,427, Cl. 428-195.000.

Kawatsu, Teruo: *See—*
Gounji, Takashi; Kawatsu, Teruo; Kasai, Yoshihiko; and Takeuchi, Chikao, 4,555,682, Cl. 333-189.000.

Kays, William A.: *See—*
Sieloff, Ronald F.; and Kays, William A., 4,555,447, Cl. 428-392.000.

Keese, Frank M.: *See—*
Effenberger, John A.; and Keese, Frank M., 4,555,543, Cl. 524-520.000.

Kehoe, Steven D.: *See—*
Claney, Robert L.; Walton, Herbert H.; Kehoe, Steven D.; and Barron, Kimball R., 4,554,943, Cl. 137-242.000.

Keiper Recaro GmbH & Co.: *See—*
Goldner, Walther, 4,555,137, Cl. 297-284.000.

Kellner, Phillip R.: *See—*
Gamson, Alan R.; and Kellner, Phillip R., 4,555,475, Cl. 430-309.000.

Kelsey-Hayes Co.: *See—*
Frait, John S.; Lowman, Clark E.; Morris, George W., III; and Tribe, Leonard T., 4,555,120, Cl. 280-6.100.

Kelterbaum, Manfred: *See—*
Wallner, Josef; and Kelterbaum, Manfred, 4,555,087, Cl. 249-78.000.

Kendall, Harry A.: *See—*
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., 4,555,091, Cl. 254-267.000.

Kendrick, Aidan G.: *See—*
Banister, Arthur J.; Hauptman, Zdenek V.; and Kendrick, Aidan G., 4,555,316, Cl. 204-59.00R.

Kenny, John. Speedometer cable lubricating device. 4,554,998, Cl. 184-15.100.

Kent, David, to Guelph Elastic Hosiery Company Limited. Flotation vest construction. 4,555,234, Cl. 441-106.000.

Kent, John S.: *See—*
Goodwin, Alton C.; Junglen, Mark T.; and Kent, John S., 4,554,963, Cl. 165-1.000.

Kern, Hans; and Haslberger, Richard, to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW). Metering apparatus. 4,554,939, Cl. 137-99.000.

Kerr, Paul R.: *See—*
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., 4,555,551, Cl. 525-455.000.

Key Pharmaceuticals, Inc.: *See—*
Hsiao, Charles H., 4,555,399, Cl. 424-35.000.

Khan, Aman U., to Whirlpool Corporation. Condensate receptacle support for dehumidifier. 4,554,794, Cl. 62-150.000.

Khoe, Giok D.; and van Heuven, Johannes H. C., to U.S. Philips Corporation. Distribution system for a local area network. 4,555,810, Cl. 455-612.000.

Khoi, Danny J., to Materiel et Auxiliaire de Signalisation et de Controle pour l'Automation-Auxitrol. Level detection head for hydrostatic effect with protection. 4,554,830, Cl. 73-299.000.

Kido, Keishiro; Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Iijima, Toshio; and Nozaki, Nobuharu, to Fuji Photo Film Co., Ltd. Amorphous silicon electrophotographic photosensitive materials. 4,555,464, Cl. 430-67.000.

Kiesewetter, Holger; Jung, Friedrich; and Roggenkamp, Hans-Gunther. Apparatus for determining the viscosity of fluids, in particular blood plasma. 4,554,821, Cl. 73-55.000.

Kiko, Frederick H.: *See—*
Hackett-Jones, Francis C.; and Kiko, Frederick H., 4,555,599, Cl. 179-170.00R.

Kikuchi, Hiroshi: *See—*
Tanaka, Isamu; Kikuchi, Hiroshi; Tomizawa, Akira; and Oka, Hitoshi, 4,555,532, Cl. 523-400.000.

Kikugawa, Shozo; and Yasufuku, Yoshitaka, to Konishiroku Photo Industry Co., Ltd. Magnetic recording medium. 4,555,443, Cl. 428-336.000.

Kimbara, Masahiko: *See—*
Hirano, Hideo; and Kimbara, Masahiko, 4,554,951, Cl. 139-105.000.

Kimble, James B.: *See—*
Kukes, Simon G.; and Kimble, James B., 4,555,499, Cl. 502-208.000.

Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluorinated ether acyl fluorides having alkylthio or alkylsulfone groups. 4,555,369, Cl. 260-544.00F.

Kimura, Hiroshi; Mori, Ikurou; and Murai, Bunjirou, to Toshiba Silicone Co., Ltd. Composition for coating. 4,555,545, Cl. 524-858.000.

Kimura, Hiroshi; Mori, Ikurou; and Murai, Bunjirou, to Toshiba Silicone Co., Ltd. Method for making novel copolymer. 4,555,559, Cl. 528-16.000.

Kindle, Edwin: *See—*
Gassner, Theo; Hann, Bruno; and Kindle, Edwin, 4,554,861, Cl. 91-446.000.

Kindlein, Irmgard: *See—*
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,554,715, Cl. 28-107.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,424, Cl. 428-91.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,425, Cl. 428-91.000.

King, Francis G.; and Gable, Stewart V., to Ford Motor Company. Automated manual transmission shifter with electronic control actuators external of the vehicle. 4,554,824, Cl. 73-117.000.

King, James B.: *See—*
Raccah, Edward R.; and King, James B., 4,555,232, Cl. 432-222.000.

King, Lucy W.: *See—*
Lertora, Juan J. L.; and King, Lucy W., 4,555,525, Cl. 514-616.000.

Kirby-Smith, Trevor R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Wind indicators. 4,554,827, Cl. 73-189.000.

Kircher, Dieter: *See—*
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,555,144, Cl. 303-92.000.

Kirchhoff, Hans: *See—*
Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; and Stodt, Rolf, 4,554,813, Cl. 72-251.000.

Kirino, Fumiyoshi: *See—*
Kanehori, Keiichi; Miyauchi, Katsuki; Ito, Yukio; Kirino, Fumiyoshi; and Kudo, Tetsuichi, 4,555,456, Cl. 429-131.000.

Kirkland, Alvin E., to Conlin Bros., Inc. Replaceable shoulder padding for football and the like. 4,554,681, Cl. 2-2.000.

Kirsch, Albert J. Hemming rule. 4,554,739, Cl. 33-2.00H.

Kiselev, Vladimir G.: *See—*
Vasiliev, Leonard L.; Kiselev, Vladimir G.; Morgun, Valery A.; Marchenko, Anatoly M.; Rudnev, Evgeny A.; Nesvit, Vasily A.; Dunaevsky, Leonid M.; Tverdokhleb, Nikolai F.; Bogdanov, Vladimir M.; and Rabetsky, Mikhail I., 4,554,966, Cl. 165-104.210.

Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, to Fanuc Ltd. Method and apparatus for entering graphics. 4,555,590, Cl. 178-18.000.

Kissel, Gary T., to Allis-Chalmers Corporation. Corner connector clip in an air filter grid. 4,555,255, Cl. 55-355.000.

Kitajima, Masao; Seshimoto, Osamu; and Mizutani, Shigemitsu, to Fuji Photo Film Co., Ltd. Ion selective electrode and process of preparing the same. 4,555,274, Cl. 148-6.14R.

Kitamura, Hiroki: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; Kiuchi, Tsutomu; and Kitamura, Hiroki, 4,555,714, Cl. 346-76.0PH.

Kitzer, Peter: *See—*
Behrens, Gunter; Schmitz, Walter; Kitzer, Peter; and Rusch, Dieter, 4,555,585, Cl. 136-245.000.

Kiuchi, Tsutomu: *See—*
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; Kiuchi, Tsutomu; and Kitamura, Hiroki, 4,555,714, Cl. 346-76.0PH.

Kiwak, Robert S.: *See—*
Sorensen, Ian W.; and Kiwak, Robert S., 4,555,393, Cl. 423-447.100.

Kiyotomo, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Plastic molding apparatus. 4,555,086, Cl. 249-67.000.

KLA Instruments Corporation: *See—*
Broadbent, William H., Jr.; Buchholz, Steve; Eldredge, Peter; and Wihl, Mark J., 4,555,798, Cl. 382-8.000.

Klaass, Reinhard M.; and Suriano, Francis J., to Garrett Corporation, The. Foil bearing alignment. 4,555,187, Cl. 384-103.000.

Klammer, Mark S.; and Decko, Del P., to Johnson Fishing, Inc. Shock-absorbing bow mount for trolling motor. 4,555,233, Cl. 440-56.000.

Klauke, Erich; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Process for the preparation of acyl cyanides. 4,555,370, Cl. 260-545.00R.

Klein, Lawrence F.: *See*—
Caridis, Andrew A.; Benson, Clark K.; and Klein, Lawrence F., 4,554,865, Cl. 99-353.000.

Klockner CRA Technologie GmbH: *See*—
Chitil, Manfred, 4,555,267, Cl. 75-46.000.

Kloeckner-Humboldt-Deutz AG: *See*—
Binder, Berthold; and Purrer, Josef, 4,555,065, Cl. 241-241.000.

Klopp, Ludwig: *See*—
Leifeld, Ferdinand; Coenen, Rolf; Oelering, Werner; and Klopp, Ludwig, 4,554,708, Cl. 19-80.00R.

Klumper, Jan W.; and Visser, Huibert, to de Nederlandsche Bank N.V. Apparatus for automatically detecting and evaluating the characteristics of prints. 4,555,181, Cl. 356-448.000.

Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, to Robert Bosch GmbH. Electromagnetically actuated valve, in particular a fuel injection valve for fuel injection systems. 4,555,060, Cl. 239-585.000.

Knapp, Scott R.; and Kolada, Paul P., to Kohler Co. Water distribution system for showers. 4,554,690, Cl. 4-601.000.

Knauer, Robert C., Jr.: *See*—
Stanley, Roderic K.; Milewits, Marvin; Knauer, Robert C., Jr.; and Bradfield, James E., 4,555,665, Cl. 324-229.000.

Kochte, Werner W.; and Nimon, Susan K., to Scott & Fetzer Company, The. Vacuum driven tool. 4,554,702, Cl. 15-372.000.

Kockumation AB, Remadivisionen: *See*—
Bjorkelund, Mats, 4,555,633, Cl. 250-560.000.

Kodama, Hiroaki; Kubo, Tetsuo; and Miwa, Sinkichi, to Sumitomo Electric Industries, Ltd. Method for inspecting crimp bonded terminals. 4,555,799, Cl. 382-8.000.

Koga, Yoshiro; and Nakao, Kenji, to Onkyo Kabushiki Kaisha. Rectified and smoothed DC supplying circuitry. 4,555,751, Cl. 363-44.000.

Kohler Co.: *See*—
Knapp, Scott R.; and Kolada, Paul P., 4,554,690, Cl. 4-601.000.

Koide, Hiroshi, to Ricoh Co. Ltd. Optical recording and playback unit. 4,555,780, Cl. 369-43.000.

Koike, Mitsuhiro: *See*—
Sakuragi, Toshio; Nakayama, Kazuo; Sato, Masaaki; and Koike, Mitsuhiro, 4,554,835, Cl. 73-640.000.

Koike, Takahisa, to Ricoh Company, Ltd. Charge-controlled ink-jet printing method and apparatus. 4,555,710, Cl. 346-1.100.

Kokken, Johannes E.: *See*—
de Willigen, Hans C.; and Kokken, Johannes E., 4,555,148, Cl. 308-6.00R.

Kokubu, Sadao; Hirano, Masatoshi; and Sakakibara, Takao, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Timer circuit. 4,555,743, Cl. 361-196.000.

Kolada, Paul P.: *See*—
Knapp, Scott R.; and Kolada, Paul P., 4,554,690, Cl. 4-601.000.

Koleske, Joseph V.; Peacock, Glenn S.; and Kwiatkowski, George T., to Union Carbide Corporation. Magnetic recording medium. 4,555,449, Cl. 428-411.100.

Komatsu, Hideo; Harada, Hiroyuki; and Matsuki, Tomiji, to Toray Industries, Inc. Polyester-polyether copolymer composition. 4,555,542, Cl. 524-178.000.

Komoda, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for controlling ignition timing of an internal combustion engine. 4,554,900, Cl. 123-418.000.

Komornicki, Jacques: *See*—
Bauer, Denise; Komornicki, Jacques; and Tellier, Jacques, 4,555,343, Cl. 210-643.000.

Kongoh, Takeshi, to Janome Sewing Machine Industry Co., Ltd. Electronic sewing machine. 4,554,880, Cl. 112-454.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kikugawa, Shozo; and Yasufuku, Yoshitaka, 4,555,443, Cl. 428-336.000.
Mogi, Michio, 4,555,172, Cl. 355-3.0DD.

Koomey, Inc.: *See*—
Loup, Ronald L., 4,554,940, Cl. 137-116.000.

Koppers Company, Inc.: *See*—
Fisher, Chester D., 4,555,254, Cl. 55-345.000.

Korber, Klaus: *See*—
Simon, Fritz; Korber, Klaus; Bandelow, Horst; Scherer, Michael; Wilke, Dieter; Thron, Werner; and Preuk, Gerhard, 4,554,707, Cl. 17-47.000.

Kordis, Thomas F.: *See*—
Johnson, Donald L.; and Kordis, Thomas F., 4,555,157, Cl. 339-75.0MP.

Korf Technologies, Inc.: *See*—
Wells, William, 4,555,266, Cl. 75-53.000.

Kotera, Nobuo; Hatano, Yuji; Asano, Atsushi; and Kawabe, Ushio, to Hitachi, Ltd. Superconducting logic circuit and superconducting switching device therefor. 4,555,643, Cl. 307-476.000.

Kotzur, Joachim, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Liquid shaft packing having a reduced slide ring temperature. 4,555,117, Cl. 277-173.000.

Kouda, Jyounichi: *See*—
Yokoyama, Shigeki; Nakamura, Koki; Kouda, Jyounichi; and Sekiguchi, Nobuhisa, 4,555,480, Cl. 430-527.000.

Kourimsky, Friedrich J. A., to AMP Incorporated. Electrical connector assembly having mating and unmating removable keys. 4,555,156, Cl. 339-75.00M.

Koyama, Hiroyasu: *See*—
Tahara, Yoshiyuki; Takahashi, Toshihiro; Koyama, Hiroyasu; Suzuki, Yoshikuni; and Yasuda, Masatoshi, 4,555,365, Cl. 260-404.000.

Krambeck, Frederick J.; McGovern, Stephen J.; and Sauer, John E., to Mobil Oil Corporation. Method and apparatus for injecting liquid hydrocarbon feed and steam into a catalytic cracking zone. 4,555,328, Cl. 208-157.000.

Kramer, Franklin; Bruins, Henderikus B.; Giacone, Joseph; and Carbillet, Luc L., to General Foods Corporation. Continuous chewing gum method. 4,555,407, Cl. 426-5.000.

Kramer, George J., to Minnesota Mining and Manufacturing Company. Magnetically attractable developer material transport apparatus. 4,555,174, Cl. 355-3.0DD.

Krasborn, Gottfried: *See*—
Roentgen, Paul; Krumm, Helmut; Krasborn, Gottfried; and Lenzen, Gunter, 4,555,607, Cl. 219-10.570.

Kraus, Guenther M.: *See*—
Carty, Michael W.; and Kraus, Guenther M., 4,554,721, Cl. 29-416.000.

Krauss, Rudolf: *See*—
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,555,060, Cl. 239-585.000.

Kreager, William D., to Frito-Lay, Inc. Method and apparatus forming fin-type back seal using cohesive sealants without externally applied heat. 4,555,289, Cl. 156-203.000.

Krempa, James F., to Chain Supply Company. Conveyor chain link structure. 4,555,014, Cl. 198-852.000.

Krenkel, Bernhard; and Joos, Heinz, to F. Oberdorfer. Loom for weaving flat fabric. 4,554,954, Cl. 139-439.000.

Kress, Donald W. Pressure sensing device and method for preventing ulcer formation. 4,554,930, Cl. 128-774.000.

Krishnamurthy, Sowmithri, to Mobil Oil Corporation. Reactivation of noble metal-containing zeolite catalyst materials. 4,555,495, Cl. 502-50.000.

Krumm, Helmut: *See*—
Roentgen, Paul; Krumm, Helmut; Krasborn, Gottfried; and Lenzen, Gunter, 4,555,607, Cl. 219-10.570.

Krupp Polysius AG: *See*—
Grachtrup, Heinz, 4,554,876, Cl. 110-246.000.

Kubli, Robert A.: *See*—
Flanagan, James L.; and Kubli, Robert A., 4,555,598, Cl. 179-121.00D.

Kubo, Tetsuo: *See*—
Kodama, Hiroaki; Kubo, Tetsuo; and Miwa, Sinkichi, 4,555,799, Cl. 382-8.000.

Kudlich, Walter: *See*—
Voss, Jurgen; Dombkowski, Otto; Kudlich, Walter; and Stodulka, Jan, 4,555,024, Cl. 206-454.000.

Kudo, Tetsuichi: *See*—
Kanehori, Keiichi; Miyauchi, Katsuki; Ito, Yukio; Kirino, Fumiyoshi; and Kudo, Tetsuichi, 4,555,456, Cl. 429-131.000.

Kuehling, Guenter F., to Allied Corporation. Manual cable clamp closure. 4,554,818, Cl. 72-410.000.

Kuehn, Thomas H., to Iowa State University Research Foundation, Inc. Net energy transfer measurement methods, apparatus and systems with solar energy and control applications. 4,555,764, Cl. 364-557.000.

Kukes, Simon G.; and Kimble, James B., to Phillips Petroleum Company. Catalyst for demetallization of hydrocarbon containing feed streams. 4,555,499, Cl. 502-208.000.

Kukes, Simon G., to Phillips Petroleum Company. Catalyst for hydrofining process for hydrocarbon-containing feed streams. 4,555,500, Cl. 502-334.000.

Kulczycki, Elaine S.: *See*—
Habel, Paul A.; and Kulczycki, Elaine S., 4,555,009, Cl. 192-106.200.

Kumamura, Masaaki: *See*—
Nishiike, Naritoshi; Nishimaki, Takashi; Miura, Yasushi; and Kumamura, Masaaki, 4,555,228, Cl. 425-185.000.

Kunert, Heinz, to Saint-Gobain Vitrage. Anti-glare glass pane for a vehicle. 4,555,434, Cl. 428-194.000.

Kuno, Akira: *See*—
Matsumoto, Muneaki; Kuno, Akira; and Numata, Koji, 4,555,761, Cl. 364-424.000.

Kunzler, Wilhelm F.; and Coombs, William F., to Bausch & Lomb Incorporated. Rotational molding of contact lenses. 4,555,372, Cl. 264-2.100.

Kuranishi, Masaaki: *See*—
Aiba, Masahiko; Kuranishi, Masaaki; and Miyake, Hideyuki, 4,555,718, Cl. 346-140.00R.

Kuraray Company, Ltd.: *See*—
Ueeda, Ryuhei; Fujii, Kiyonobu; and Narukawa, Hiroshi, 4,555,439, Cl. 428-221.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohara, Minoru; and Ando, Takao, 4,555,505, Cl. 514-42.000.

Kurihara, Nobuo: *See*—
Nishikawa, Mitsuyo; and Kurihara, Nobuo, 4,555,800, Cl. 382-25.000.

Kurosaki, Teikichi: *See*—
Hamada, Masaaki; Okamaoto, Kaoru; and Kurosaki, Teikichi, 4,555,513, Cl. 514-311.000.

Kurosawa, Ryoichi, to Kabushiki Kaisha Toshiba. AC Power converter with commutation circuit for reducing reactive power. 4,555,752, Cl. 363-68.000.

Kurosawa, Ryoichi; and Shimamura, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. AC Current control system. 4,555,755, Cl. 363-160.000.

Kurtz, John A.; Cousens, Donald E.; and Dufour, Mark D., to Fairchild Camera & Instrument Corporation. Lead wire bond attempt detection. 4,555,052, Cl. 228-104.000.

Kurusu, Yasuo: *See*—
Masuda, Tatsunosuke; Hohki, Tetsuo; and Kurusu, Yasuo, 4,555,180, Cl. 356-445.000.

Kustka, D. Lucinda. Unity candle. 4,555,231, Cl. 431-288.000.

Kusumoto, Hiroshi: *See*—
Iseki, Masahide; Yoshiyama, Toshio; Kajita, Hiroshi; Itakiyo, Masanori; Kusumoto, Hiroshi; Kawamori, Yoshizo; and Kawamoto, Masuo, 4,555,173, Cl. 355-3.00R.

Kwiatkowski, George T.: *See*—
Koleske, Joseph V.; Peacock, Glenn S.; and Kwiatkowski, George T., 4,555,449, Cl. 428-411.100.

Kyowa Hakko Kogyo Co. Ltd.: *See*—
Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, 4,555,402, Cl. 424-122.000.

Labenz, Gary F. Boot guard for sewer manhole construction. 4,554,772, Cl. 52-396.000.

Labsystems Oy: *See*—
Harjunmaa, Hannu, 4,555,178, Cl. 356-339.000.

Ladd, Harry E.: *See*—
Angelucci, Richard J.; Cope, Andrew P.; Hallam, Donald E.; and Ladd, Harry E., 4,555,067, Cl. 242-35.50A.

Laidig, Manfred R., to Singer Company, The. Sewing machine presser device with feed drift control. 4,554,878, Cl. 112-235.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Marhic, Gerard; Schaff, Didier; and Remy, Francis, 4,555,609, Cl. 219-121.0PC.

Lally, James J., to Health Education Publication Company, Inc. Cardio pulmonary resuscitation pressure indicator. 4,554,910, Cl. 128-28.000.

Lam, Ping H., to Wallace Companies, Inc., The. Modular connector and system containing the same. 4,555,158, Cl. 339-99.00R.

Landis, Phillip S.: *See*—
Horodysky, Andrew G.; and Landis, Phillip S., 4,555,353, Cl. 252-49.600.

Landscheidt, Alfons, to Chemische Fabrik Stockhausen GmbH. Process for the production of 7-oxabicyclo (2.2.1)hept-5-ene derivatives. 4,555,581, Cl. 549-463.000.

Lane, Joseph A.: *See*—
Hull, Robert; and Lane, Joseph A., 4,555,253, Cl. 55-170.000.

Lane, Leonard A., to Illirrie Holdings Pty Ltd. Trapeze system. 4,554,881, Cl. 114-39.000.

Lane, Wallace W. Modular floating structure. 4,554,883, Cl. 114-266.000.

Lang Fastener Corporation: *See*—
Hendry, James W., 4,555,225, Cl. 425-4.00R.

Lang, Thomas J.: *See*—
Distin, Robert G., Jr.; Lang, Thomas J.; and Smith, David E., 4,554,846, Cl. 74-805.000.

Lange, Alois: *See*—
Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., 4,554,965, Cl. 165-95.000.

Lange, Wolf-Ruediger; Wessel, Anton; Bohler, Udo; Volkheimer, Klaus; Greiner, Gunter; and Islet, Peter, to Rohde & Schwarz GmbH & Co. KG. System for the automatic establishment of a shortwave telegraphy signal connection. 4,555,806, Cl. 455-62.000.

Langerholc, John; and Halldorsson, Thorsteinn. Detection and imaging of objects in scattering media by light irradiation. 4,555,179, Cl. 356-342.000.

LaRossa, Denise D.; Thunberg, Allen L.; Norton, Gary E.; and Dappen, Glen M., to Eastman Kodak Company. Analytical element and method for alkaline phosphatase assay. 4,555,484, Cl. 435-21.000.

Larson, Bradley W., to Mead Corporation, The. Bottom level sheet feeding apparatus. 4,555,103, Cl. 271-35.000.

Larson, Roger: *See*—
Bridgewater, Walter F.; De Caro, Robert E.; Larson, Roger; and Wall, Llewellyn E., 4,555,623, Cl. 250-214.00A.

Laton, Richard W.: *See*—
Galani, Zvi; Laton, Richard W.; Waterman, Raymond C., Jr.; and DiBiase, Robert, 4,555,678, Cl. 331-1.00A.

Laurent, Henry: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,555,507, Cl. 514-172.000.

Laval, Claude C., Jr. Self-purging separator. 4,555,333, Cl. 210-113.000.

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Leas, Arnold M. Solid fuel gasifying unit and gas fractionating unit. 4,555,249, Cl. 48-62.00R.

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Cohen, Saul M.; and LeBlanc, John R., 4,555,319, Cl. 204-159.210.

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Whiteside, Robert C.; Arends, Albert W.; and Karklin, Roland, 4,555,377, Cl. 264-292.000.

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Hiatt, Sidney A., 4,555,097, Cl. 267-100.000.
Whitehead, Larry W., 4,554,692, Cl. 5-411.000.

Leib, Roger K. Patient's defined-motion chair. 4,555,139, Cl. 297-460.000.

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Byer, Robert L., 4,555,786, Cl. 372-70.000.

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Brooks, Ralf M.; and Lepic, Daniel A., 4,555,617, Cl. 235-379.000.

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Mathieu, Michel G.; and Le Rodallec, Andre J. L., 4,555,736, Cl. 358-342.000.

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Bonicel, Jean-Pierre; Prigent, Madeleine; and Cottevieille, Christian, 4,555,539, Cl. 524-127.000.

Leskovec, Robert A.; Davenport, John M.; and von Herrmann, Pieter J., to General Electric Company. Ballast circuit for gas discharge tubes utilizing time-pulse additions. 4,555,647, Cl. 315-179.000.

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Borovian, Gayle E., 4,555,400, Cl. 424-78.000.
Butterworth, Robert M.; and Wells, Martin A., 4,555,349, Cl. 252-8.600.
Clarke, David E.; Davies, James F.; Smart, Colin; and Tune, John B., 4,555,354, Cl. 252-90.000.
Moran, David P. J.; Hepburn, John J.; and Sharp, David G., 4,555,411, Cl. 426-603.000.

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Bricaud, Herve ; and L'Henaff, Patrick, 4,555,153, Cl. 339-17.0CF.

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Behrens, Gunter; Schmitz, Walter; Kitzer, Peter; and Rusch, Dieter, 4,555,585, Cl. 136-245.000.

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Lilley, Jay S., to United States of America, Army. Method for burning rate characterization of solid propellants. 4,554,823, Cl. 73-116.000.

Lilly, Gerard P., to Westinghouse Electric Corp. Hybrid preheat/recirculating steam generator. 4,554,889, Cl. 122-32.000.

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Skolaude, Werner; and Eggendorfer, Gunnar, 4,555,256, Cl. 62-18.000.

Linde, Gilbert W., to Sperry Corporation. Manure spreader expeller flail. 4,555,061, Cl. 239-675.000.

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Citron, Alan L.; Lindquist, Thomas W. F.; and Popp, William E., 4,555,699, Cl. 340-707.000.

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Jonsson, Ernst U.; Lindqvist, Sten-Borje; and Wimmerstedt, Roland V., 4,555,251, Cl. 55-48.000.

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Linhoff & Thesenfitz Maschinenbau GmbH: *See—*
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Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,555,351, Cl. 252-8.55D.

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Kamienski, Conrad W., 4,555,498, Cl. 502-153.000.

Litman, Ira. Method and apparatus for obtaining the combined aroma of several substances. 4,554,820, Cl. 73-23.000.

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Danielsen, Donald P.; and Lively, Lewell M., Jr., 4,555,133, Cl. 294-82.240.

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Op de Beek, Johannes C. A.; and Lobregt, Steven, 4,555,760, Cl. 364-414.000.

Lockard, Walter G.; Patel, Nathalal G.; and Boris, Allen J., to Invacare Corporation. Invalid's chair to facilitate transfer to an automobile. 4,555,121, Cl. 280-30.000.

Lockhart, Bobby: *See—*
Molloy, Michael P., 4,554,758, Cl. 43-61.000.

Loeser, Cary A.: *See—*
Eisenhauer, Roy J.; Loeser, Cary A.; and Goodner, Charles G., Jr., 4,554,822, Cl. 73-61.00R.

Lohner, Manfred: *See—*
Gruber, Klaus; Lohner, Manfred; Posselt, Klaus; and Wagener, Hans H., 4,555,524, Cl. 514-570.000.

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Collins, Michael F.; and Lordi, Francis D., 4,555,612, Cl. 219-121.00P.

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de la Mettrie, Roland; and Canivet, Patrick, 4,555,247, Cl. 8-405.000.
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Losel, Walter: *See—*
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Brantl, Victor; Teschemacher, Hansjorg; Henschen, Agnes; and Lottspeich, Friedrich, 4,555,403, Cl. 514-17.000.

Loup, Ronald L., to Koomey, Inc. Pressure reducing and regulating valve. 4,554,940, Cl. 137-116.000.

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Hor, Ah-Mee; and Loutfy, Rafik O., 4,555,463, Cl. 430-59.000.

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Frait, John S.; Lowman, Clark E.; Morris, George W., III; and Tribe, Leonard T., 4,555,120, Cl. 280-6.100.

Lucas, Gary M., to General Electric Company. Curable silicone compositions and processes. 4,555,420, Cl. 427-387.000.

Ludwig, Peter; and Steiner, Meinrad, to Mettler Instrumente AG. Method and system for displaying relative values on a multi-segment display. 4,554,988, Cl. 177-178.000.

Luecke, Greg R.: *See—*
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Lukens General Industries, Inc.: *See—*
Schmitt, Dallas L.; and Spencer, Kenneth E., 4,554,875, Cl. 105-221.00R.

Lukens, William E.: *See—*
Morris, Richard A.; Lukens, William E.; and Zanis, Charles A., 4,555,614, Cl. 219-130.010.

Lundstrom, Kristian, to Tamfelt Oy Ab. Method and means for removing water from a web in a press of a papermaking machine. 4,555,306, Cl. 162-205.000.

Lupke, Manfred A. A. Calibrator for use in the manufacture of double walled thermoplastic pipe. 4,555,230, Cl. 425-325.000.

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Harms, Margret; Bruns, Angelika; Luthje, Holger; and Matthiessen, Bernd, 4,555,460, Cl. 430-5.000.

Lutkowski, Lawrence: *See—*
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Lutz, James F.: *See—*
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Lyman, John B., to Whirlpool Corporation. Invisible hinge means for lid and hood of a canister vacuum cleaner. 4,554,700, Cl. 15-323.000.

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M/A-COM, Inc.: *See—*
Burr, John E., 4,555,680, Cl. 331-86.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg AG: *See—*
Holz, Joachim; Meier, Wolfgang; Schwarting, Karl-Heinz; Goris, Heinrich; and Ogorek, Kurt, 4,555,142, Cl. 299-43.000.
Kotzur, Joachim, 4,555,117, Cl. 277-173.000.

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Thudt, Hubert; and Winkler, Harald, 4,554,874, Cl. 104-247.000.

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Fischer, Hermann, 4,554,870, Cl. 101-365.000.

Machida, Haruchika; and Yuchi, Sadataka, to Hochiki Kabushiki Kaisha. Fire alarm system. 4,555,695, Cl. 340-538.000.

Maeda, Yoshiyasu; Ueura, Akira; Sato, Kazuyoshi; and Watanabe, Katsunori, to Murata Kikai Kabushiki Kaisha. Yarn winding apparatus and method. 4,555,069, Cl. 242-43.00R.

Maehara, Toshifumi; and Yoshizawa, Hiroyuki, to Akebono Brake Industry Company Ltd. Anti-lock system for vehicles. 4,555,145, Cl. 303-92.000.

Mahal, Harbhajan S.: *See—*
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Maier, Alfred E.; and Ricci, Louis N., to Westinghouse Electric Corp. Circuit breaker having improved stab assembly. 4,555,604, Cl. 200-255.000.

Maier, Peter; Schirrmacher, Roland; and Simen, Rolf. Support for endless grinding sleeves. 4,555,199, Cl. 403-370.000.

Maier, Wilfried: *See—*
Wrulich, Herwig; Schetina, Otto; Siebenhofer, Gottfried; and Maier, Wilfried, 4,555,143, Cl. 299-81.000.

Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., to PPG Industries, Inc. Method of molding. 4,555,551, Cl. 525-455.000.

Maki, Hirohisa; Sano, Takashi; and Yamamoto, Misao, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Anti-corrosive coating composition. 4,555,536, Cl. 524-66.000.

Makiyo, Minoru: *See—*
Nakamura, Koichi; Ishibashi, Masashi; Kameda, Hideki; and Makiyo, Minoru, 4,555,422, Cl. 428-36.000.

Mallinckrodt, Inc.: *See—*
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Manville Service Corporation: *See—*
Ekdahl, Wendell G.; Chaudhuri, Asit R.; and Miiller, William C., 4,555,492, Cl. 501-38.000.

Mao, Mark H. K.: *See—*
Bissett, Donald L.; and Mao, Mark H. K., 4,555,360, Cl. 252-541.000.

Marathon Oil Company: *See—*
Plummer, Mark A., 4,555,327, Cl. 208-108.000.

Marchenko, Anatoly M.: *See—*
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Marchesi, Franco, to Rockwell-Rimoldi S.p.A. Anti-wobble device for a connecting rod. 4,554,840, Cl. 74-42.000.

Marchionda, Tony. Oil spill collector. 4,555,338, Cl. 210-242.400.

Margulefsky, Allen L.; and Lutz, James F. Method and apparatus for rehabilitating refrigerant. 4,554,792, Cl. 62-77.000.

Marhic, Gerard; Schaff, Didier; and Remy, Francis, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Arc working torches. 4,555,609, Cl. 219-121.0PC.

Maringer, Melvin F.; and Morgan, Fred K., to National Distillers and Chemical Corporation. Cross-linkable rotational molding compositions. 4,555,379, Cl. 264-310.000.

Markham, Charles W. Flexible and protective guide device for use with aspirating needles. 4,555,243, Cl. 604-263.000.

Maroney, Ralf P.; and Fishkind, Gregory A., to Plug-In Storage Systems, Inc. Storage cabinet. 4,555,744, Cl. 361-212.000.

Marpac Industries, Inc.: *See—*
Sykes, Donald J.; and Gendron, Gary E., 4,555,023, Cl. 206-446.000.

Marrelli, Ronald E., to Phillips Petroleum Company. Method of utilizing energy of high pressure condensate. 4,555,310, Cl. 203-10.000.

Marsh, Robert A., to Ranks Hovis McDougall, PLC. Production of edible protein containing substances. 4,555,485, Cl. 435-68.000.

Martens, Gerhard, to U.S. Philips Corporation. Apparatus for transmitting signals between two relatively rotatable parts. 4,555,631, Cl. 250-551.000.

Martin, Bernard K., to T & R Chemicals, Inc. Antithrombotic and/or antihypertensive compositions. 4,555,522, Cl. 514-449.000.

Martin, Frederick W. Energy-stable accelerator with needle-like source and focused particle beam. 4,555,666, Cl. 326-233.000.
Martin Marietta Corporation: *See*—
Thornton, Michael G.; and Clark, Benton C., III, 4,555,331, Cl. 210-99.000.
Martin, Richard A.; and Bialobrzeski, Walter, to Dick Martin Design Ltd. Method of forming thermoplastic perforated sheet. 4,555,378, Cl. 264-292.000.
Martin, Richard A., to Dick Martin Design, Ltd. Curved needlepoint canvas. 4,555,429, Cl. 428-131.000.
Martinez, Kenneth: *See*—
Betts, William L.; and Martinez, Kenneth, 4,555,790, Cl. 375-39.000.
Maruyama, Ryozi, to Dai-Ichi Seiko Co., Ltd. Formed permanent magnet. 4,555,685, Cl. 335-303.000.
Maruyama, Toshinori: *See*—
Kato, Hidetoshi; Maruyama, Toshinori; Matsuhashi, Hajime; and Akita, Yoshio, 4,555,657, Cl. 320-64.000.
Marwah, Ashok K.; and Norris, Charles H., Jr., to H. H. Robertson Company. Field-assembled cellular decking unit. 4,554,771, Cl. 52-221.000.
Masaki, Kazumi, to Hayashibara, Ken. Device for eliminating inrush-current. 4,555,741, Cl. 361-58.000.
Masaki, Seishi: *See*—
Obata, Keigo; Dohi, Nobuyasu; Okuhama, Yoshiaki; Masaki, Seishi; Okada, Yukiyoshi; and Yoshida, Tadashi, 4,555,314, Cl. 204-44.400.
Masenas, Charles J., Jr., to International Business Machines Corporation. Voltage balancing circuit for memory systems. 4,555,776, Cl. 365-202.000.
Masghati, Mohammad, to Wilson Sporting Goods Company. Golf club shafts with matched frequencies of vibration. 4,555,112, Cl. 273-77.00A.
Masuda, Takashi: *See*—
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Masuda, Tatsunosuke; Hohki, Tetsuo; and Kurusu, Yasuo, to Dainippon Screen Mfg. Co., Ltd. Printed area measuring apparatus. 4,555,180, Cl. 356-445.000.
Materiel et Auxiliaire de Signalisation et de Controle pour l'Automation-Auxitrol: *See*—
Khoi, Danny J., 4,554,830, Cl. 73-299.000.
Mathieu, Michel G.; and Le Rodallec, Andre J. L., to Etablissement Public de Diffusion dit Telediffusion de France; and Le Rodallec, Andre J. L. Disc and videodisc reader head positioning control system. 4,555,736, Cl. 358-342.000.
Matsuda, Ikuo: *See*—
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Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, to Kyowa Hakko Kogyo Co. Ltd. Physiologically active substance K-252, process for producing same and pharmaceutical composition containing same. 4,555,402, Cl. 424-122.000.
Matsuhashi, Hajime: *See*—
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Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.
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Matsumoto, Muneaki; Kuro, Akira; and Numata, Koji, to Nippon Soken, Inc. Direction detection for a vehicle. 4,555,761, Cl. 364-424.000.
Matsumura, Susumu; Hosokawa, Yasuhiko; Katsuki, Kanji; and Yano, Masao, to Matsumura, Susumu; and Mitsubishi Denki Kabushiki Kaisha. Control apparatus for D.C. power transmission system. 4,555,750, Cl. 363-37.000.
Matsunaga, Kenichi: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohara, Minoru; and Ando, Takao, 4,555,505, Cl. 514-42.000.
Matsuo, Yoshihiro: *See*—
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Matsushita Electric Industrial Company, Limited: *See*—
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Mizukawa, Takumi; Ogino, Yoshio; Ohmori, Hideki; and Sato, Taketoshi, 4,555,608, Cl. 219-10.770.
Mochizuki, Hideaki; and Tamura, Tooru, 4,555,746, Cl. 361-323.000.
Nishida, Masamitsu; Ouchi, Hiromu; and Matsuo, Yoshihiro, 4,555,494, Cl. 501-134.000.
Usuki, Hiroshi; and Taniguchi, Hiroshi, 4,555,735, Cl. 358-330.000.
Matsushita, Yasuo; Nakamura, Kousuke; and Harada, Koji, to Hitachi, Ltd. Electrically conductive sintered ceramics and ceramic heaters. 4,555,358, Cl. 252-516.000.
Matsuura, Shigeo; Ito, Uji; and Yakushiji, Yasuhiro, to Hitachi, Ltd. Remote control signal reproducing circuit. 4,555,702, Cl. 340-825.640.
Matsuzaki, Yutaka: *See*—
Horie, Shin'ichi; Matsuzaki, Yutaka; and Kagawa, Fumio, 4,555,250, Cl. 51-309.000.
Mattei, Riccardo; and Osti, Roberto, to G.D Societa' per Azioni. Method for automatically setting and joining reel-fed label strips or similar. 4,555,281, Cl. 156-64.000.
Matthiessen, Bernd: *See*—
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Matuki, Shouzo, to Taiyo Yuden Co., Ltd. Magnetic eraser dust collector. 4,554,703, Cl. 15-424.000.
Mauck, John C.: *See*—
LiMuti, Charles M.; Babb, Bruce E.; and Mauck, John C., 4,555,483, Cl. 435-19.000.
Maulding, Donald R.: *See*—
Spector, Richard; and Maulding, Donald R., 4,555,537, Cl. 524-97.000.
Mawby, Harold S.; and Frisbie, Carl W., to White Consolidated Industries, Inc. Ice door mechanism. 4,555,049, Cl. 222-517.000.
Maxson, Myron T.: *See*—
Lee, Chi-Long; Maxson, Myron T.; and Rabe, James A., 4,555,529, Cl. 521-124.000.
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., to Power Climber, Inc. Efficient lightweight hoist with multiple-cable-size traction and safety systems. 4,555,091, Cl. 254-267.000.
Mayer, Linda J.: *See*—
Barbieri, Stephen C.; and Mayer, Linda J., 4,555,315, Cl. 204-52.00R.
Mays, Alfred T., to Chicopee. Entangled nonwoven fabric made of two fibers having different lengths in which the shorter fiber is a conjugate fiber in which an exposed component thereof has a lower melting temperature than the longer fiber and method of making same. 4,555,430, Cl. 428-134.000.
Mazda Motor Corporation: *See*—
Ishimitsu, Ikuo; Tokunaga, Toshimichi; Tanaka, Takeshi; and Anan, Yoshiaki, 4,555,126, Cl. 280-707.000.
Okimoto, Haruo; and Matsuda, Ikuo, 4,554,890, Cl. 123-26.000.
Mazur, Edward J.: *See*—
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McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., to International Business Machines Corp. Selective use of restored file setups. 4,555,759, Cl. 364-300.000.
McCaskill, Rex A.: *See*—
Karnes, Roy E., Jr.; McCaskill, Rex A.; and Nguyen, Khoa D., 4,555,773, Cl. 364-900.000.
McClain, D. Wayne, to United States of America, Navy. Diver's umbilical quick-disconnect device. 4,555,130, Cl. 285-26.000.
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Sergovic, John A.; and McClinton, John L., 4,555,375, Cl. 264-259.000.
McCollum, Gregory J.: *See*—
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., 4,555,551, Cl. 525-455.000.
McCreedy, Ryan D.: *See*—
Nicolosi, Carl T.; Nicolosi, Thomas F.; and McCreedy, Ryan D., 4,554,751, Cl. 37-234.000.
McDaniel, L. Thomas: *See*—
Watson, David R.; Carithers, Val G.; and McDaniel, L. Thomas, 4,555,493, Cl. 501-127.000.
McDonnell Douglas Corporation: *See*—
Danielsen, Donald P.; and Lively, Lewell M., Jr., 4,555,133, Cl. 294-82.240.
McGinnis, Vincent D.: *See*—
Rodgers, Stephen D.; Dick, Richard J.; and McGinnis, Vincent D., 4,555,366, Cl. 260-404.800.
McGovern, Stephen J.: *See*—
Krambeck, Frederick J.; McGovern, Stephen J.; and Sauer, John E., 4,555,328, Cl. 208-157.000.
McInroy, John W.: *See*—
McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., 4,555,759, Cl. 364-300.000.
McKay, Michael L., to Orbital Engine Company Proprietary Limited. Liquid metering apparatus. 4,554,945, Cl. 137-312.000.
McManis, George E., III: *See*—
Fletcher, Aaron N.; McManis, George E., III; and Bliss, Dan E., 4,555,455, Cl. 429-112.000.
McRae, Thomas G., Jr., to United States of America, Energy. Backscatter absorption gas imaging system. 4,555,627, Cl. 250-334.000.
Mead Corporation, The: *See*—
Calvert, Rodney K., 4,554,778, Cl. 53-398.000.
Greeson, Arnold J., 4,555,709, Cl. 346-1.100.
Larson, Bradley W., 4,555,103, Cl. 271-35.000.
Media Transference International: *See*—
Briggs, James B., 4,555,730, Cl. 358-142.000.
Medical Engineering Corporation: *See*—
Carter, Garry L.; and Weeks, Vaughan B., 4,554,687, Cl. 4-144.200.
Meffert, Alfred: *See*—
Fischer, Herbert; Gorzinski, Manfred; Gress, Wolfgang; Meffert, Alfred; and Wegemund, Bernd, 4,555,564, Cl. 528-295.300.
Meier, Walter; and Jacobsen, Jan, to Walter Meier. Device for projecting steroscopic, anamorphotically compressed pairs of images on to a spherically curved wide-screen surface. 4,555,168, Cl. 353-7.000.

Meier, Wolfgang: *See*—
Holz, Joachim; Meier, Wolfgang; Schwarting, Karl-Heinz; Goris, Heinrich; and Ogorek, Kurt, 4,555,142, Cl. 299-43.000.
Meiji Seika Kaisha, Ltd.: *See*—
Nishihata, Ken; Iinuma, Katsuharu; Yamada, Hitoshi; Hirano, Fumiya; and Tsuruoka, Takashi, 4,555,404, Cl. 514-201.000.
Meinecke, Albrecht: *See*—
Steiner, Karl; Schiel, Christian; Meinecke, Albrecht; Mullner, Josef; and Weiss, Hans, 4,555,305, Cl. 162-205.000.
Melek, Bernard. Money-operated unit control system. 4,555,639, Cl. 307-38.000.
Melocik, Grant C.; and Pickering, William, to Towmotor Corporation. Motor speed control apparatus. 4,555,651, Cl. 318-341.000.
Menard, Paul: *See*—
Suh, John T.; Regan, John R.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,555,508, Cl. 514-211.000.
Mendenhall, Robert L. Apparatus and method for recycling asphaltic concrete. 4,555,182, Cl. 366-25.000.
Meneely, Dennis C.: *See*—
Cressey, John R.; and Meneely, Dennis C., 4,555,667, Cl. 329-50.000.
Meneghin, Rene : *See*—
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Mennell, Thomas W., to Y.S. Securities Limited. Draw out switchgear and operating mechanism. 4,555,602, Cl. 200-50.0AA.
Merck & Co., Inc.: *See*—
Patchett, Arthur A.; and Wu, Mu T., 4,555,502, Cl. 514-19.000.
Patchett, Arthur A., 4,555,503, Cl. 514-19.000.
Merckaert, Louis: *See*—
Nicolas, Edgard; and Merckaert, Louis, 4,555,317, Cl. 204-129.000.
Merril, Carl R., to United States of America, Health and Human Services. Rapid visualization system for gel electrophoresis. 4,555,490, Cl. 436-86.000.
Merrill, Dana A., to ITT Corporation. Multiple rate baseband receiver. 4,555,788, Cl. 375-11.000.
Merritt, David T., to Otis Engineering Corporation. Well tool locking device. 4,554,972, Cl. 166-137.000.
Mettler Instrumente AG: *See*—
Ludwig, Peter; and Steiner, Meinrad, 4,554,988, Cl. 177-178.000.
Metz, Donald L. Truck locking device. 4,555,211, Cl. 414-401.000.
Meyer, Nicolas; and Cousin, Michel, to Societe Chimique des Charbonnages CDF Chimie, S.A. Hardening phenol-formaldehyde resols in the presence of aniline. 4,555,544, Cl. 524-595.000.
Mick, Jon L.; and Wolf, Marvin L., to FMC Corporation. Heavy lift crane. 4,555,032, Cl. 212-189.000.
Mickus, Donald J., deceased: *See*—
Foley, Robert W.; Storck, Robert C.; Mickus, Donald J., deceased; and Pastors, Debbie, executrix, 4,554,979, Cl. 172-813.000.
Microcommunications, Inc.: *See*—
O'Dea, Orrin B., 4,555,593, Cl. 179-18.0GD.
Microdot Inc.: *See*—
Repella, James A., 4,554,723, Cl. 29-430.000.
Midwestern Industries, Inc.: *See*—
Tsutsumi, Masataka; and Frohman, Richard J., 4,555,330, Cl. 209-254.000.
Miiller, William C.: *See*—
Ekdahl, Wendell G.; Chaudhuri, Asit R.; and Miiller, William C., 4,555,492, Cl. 501-38.000.
Mikami, Ryuzo: *See*—
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Mikogami, Yukihiro: *See*—
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Miletti, Sandro: *See*—
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Miller, Charles D.: *See*—
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Miller, Roy W., to Pullman Standard, Inc. Slackless non-cushioned drawbar arrangement for railway car underframe. 4,555,033, Cl. 213-51.000.
Miller, William J.; and Faber, Norman, Jr., to Wacker Corporation. Flexible shaft having detachable end connections. 4,555,238, Cl. 464-52.000.
Millet, Nolan J., Jr.: *See*—
Cescon, Lawrence A.; and Millet, Nolan J., Jr., 4,555,278, Cl. 149-21.000.
Milliken Research Corporation: *See*—
Murray, John H., 4,554,705, Cl. 16-110.00R.
Millington, Michael J., to Handicart Limited. Trolley for use with a wheelchair. 4,555,124, Cl. 280-289.0WC.
Milner, Peter H., to Beecham Group p.l.c. Process for the preparation of β-lactam compounds. 4,555,363, Cl. 260-239.100.
Minnesota Mining and Manufacturing Company: *See*—
Drake, Gerald E., 4,555,155, Cl. 339-61.00R.
Engel, Michael R., 4,554,924, Cl. 128-640.000.
Kramer, George J., 4,555,174, Cl. 355-3.0DD.
Tait, William C.; and Harklau, Lanny L., 4,555,291, Cl. 156-250.000.
Minoshima, Katsuji: *See*—
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Minster Machine Company, The: *See*—
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,554,814, Cl. 72-345.000.
Miram, George V.; and Mizuhara, Yosuke M., to Varian Associates, Inc. Adjustable beam permanent-magnet-focused linear-beam microwave tube. 4,555,646, Cl. 315-5.350.
Miranti, Joseph P., Jr., to Dayco Corporation. Belt pulley and method of making the same. 4,555,239, Cl. 474-93.000.
Mirebeau, Pierre; and Gindre, Jean, to Compagnie Europeenne d'Accumulateurs, S.A. Electrolyte for a lead acid accumulator, and an accumulator using said electrolyte. 4,555,458, Cl. 429-203.000.
Mirtsch, Frank: *See*—
Wolowski, Eckard; and Mirtsch, Frank, 4,555,325, Cl. 208-10.000.
Misra, Raj N.; and Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. 2-Pyridylcarboxamides which inhibit arachidonic acid release. 4,555,520, Cl. 514-346.000.
Misumi, Teruo: *See*—
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Mita Industrial Co., Ltd.: *See*—
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Mitsubishi Denki Kabushiki Kaisha: *See*—
Kamaike, Hiroshi, 4,554,999, Cl. 187-29.00R.
Matsumura, Susumu; Hosokawa, Yasuhiko; Katsuki, Kanji; and Yano, Masao, 4,555,750, Cl. 363-37.000.
Sakuragi, Toshio; Nakayama, Kazuo; Sato, Masaaki; and Koike, Mitsuhiro, 4,554,835, Cl. 73-640.000.
Umeda, Yasukazu, 4,555,000, Cl. 187-29.00R.
Yamanaka, Kimio, 4,555,756, Cl. 364-130.000.
Mitsuboshi Belting, Ltd.: *See*—
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Mitsui Toatsu Chemicals, Incorporated: *See*—
Toyoda, Yoshiaki; Wakimura, Kazuo; Hase, Tadaharu; and Arashiba, Nobumasa, 4,555,583, Cl. 568-473.000.
Yamada, Yasuyuki; Tanaka, Tadaaki; Tukahara, Ryoichi; and Nishizawa, Tsutomu, 4,555,355, Cl. 252-299.100.
Miura, Masayoshi; and Naito, Hiroshi, to Matsushita Electric Industrial Company, Limited. Ink jet printing head utilizing pressure and potential gradients. 4,555,717, Cl. 346-140.00R.
Miura, Yasushi: *See*—
Nishiike, Naritoshi; Nishimaki, Takashi; Miura, Yasushi; and Kumamura, Masaaki, 4,555,228, Cl. 425-185.000.
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Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, to Fuji Electric Co., Ltd. Pattern discriminator. 4,555,801, Cl. 382-44.000.
Miyake, Hideyuki: *See*—
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Miyashita, Yoshikazu; Muranaka, Shiaru; and Tanaka, Hideo, to Shibuya Kogyo Co., Ltd. System for synchronizing two or more process units. 4,554,774, Cl. 53-52.000.
Miyatsuka, Hajime, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,555,431, Cl. 428-141.000.
Miyauchi, Hirotsugu: *See*—
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Miyauchi, Katsuki: *See*—
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Mizuhara, Yosuke M.: *See*—
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Mizukawa, Takumi; Ogino, Yoshio; Ohmori, Hideki; and Sato, Taketoshi, to Matsushita Electric Industrial Co., Ltd. Inverter device for induction heating. 4,555,608, Cl. 219-10.770.
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Krambeck, Frederick J.; McGovern, Stephen J.; and Sauer, John E., 4,555,328, Cl. 208-157.000.
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Saliger, Kenneth C., 4,555,118, Cl. 277-188.00R.
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Schmitt, Kirk D., 4,555,489, Cl. 436-27.000.
Mochizuki, Hideaki; and Tamura, Tooru, to Matsushita Electric Industrial Co., Ltd. Organic chip capacitor. 4,555,746, Cl. 361-323.000.
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Brown, Anthony R., 4,555,011, Cl. 198-444.000.
Moll, Eberhard, to Balzers Aktiengesellschaft. Method and apparatus for uniformly heating articles in a vacuum container. 4,555,611, Cl. 219-121.000.
Molloy, Michael P., to Lockhart, Bobby; and Bradsher, O. D., Jr., part interest to each. Tunnel trap. 4,554,758, Cl. 43-61.000.
Monarch Marking Systems, Inc.: *See—*
Derringer, Gene R., 4,554,711, Cl. 24-150.0FP.
Moniod, Jean-Michel: *See—*
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Monteiro, Frank G. Exercising and physical-conditioning apparatus. 4,555,108, Cl. 272-69.000.
Moon, Richard D. Jewelry arrangement. 4,554,800, Cl. 63-23.000.
Mooneyhan, Betty F. Hair clamp device. 4,554,934, Cl. 132-40.000.
Moore, Colin: *See—*
Clark, Frederick; and Moore, Colin, 4,555,698, Cl. 340-680.000.
Moore, David S.; and Schmidt, Stephen C., to United States of America, Energy. Method and apparatus for determining pressure-induced frequency-shifts in shock-compressed materials. 4,555,176, Cl. 356-301.000.
Moorehead, Eric L.: *See—*
Robinson, Paul R.; and Moorehead, Eric L., 4,555,584, Cl. 585-623.000.
Morales, Louis J., to Standard Microsystems Corporation. Low power CMOS input buffer circuit. 4,555,642, Cl. 307-475.000.
Moran, David P. J.; Hepburn, John J.; and Sharp, David G., to Lever Brothers Company. Process for producing a reduced fat spread. 4,555,411, Cl. 426-603.000.
Moran, James C., to Sybron Chemicals Inc. Liquid buffer system. 4,555,348, Cl. 252-1.000.
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Mori, Ikurou: *See—*
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Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.
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Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,555,351, Cl. 252-8.55D.
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Morris, Jeffrey D.; and Fuller, Robert A., to Cosden Technology, Inc. Apparatus for producing styrenic/alkenylnitrile copolymers. 4,555,384, Cl. 422-109.000.
Morris, Richard A.; Lukens, William E.; and Zanis, Charles A., to United States of America, Navy. Weld metal cooling rate indicator system. 4,555,614, Cl. 219-130.010.
Morrison, Donald R. Hydraulically-powered material spreader. 4,555,200, Cl. 404-72.000.
Morrissette, Charles G.: *See—*
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Morse, Milton, to APM Corporation. Vandal-resistant shield for telephone keypad. 4,555,600, Cl. 179-184.000.
Morton, James F. Tow bar for semi-tractors having triangulated support system and adjustable dual cylinder hydraulic control. 4,555,214, Cl. 414-563.000.
Morton Thiokol, Inc.: *See—*
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Motorola, Inc.: *See—*
Gray, Randall C.; and Jarrett, Robert B., 4,555,742, Cl. 361-93.000.
Legge, Ronald; Rice, M. John, Jr.; and Sarma, Kalluri R., 4,555,303, Cl. 156-643.000.
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Eden, Brent E., 4,554,991, Cl. 180-243.000.
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Mueller Co.: *See—*
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Muggli, Jurg; Guttinger, Heinz; and Horvath, Zoltan, to Cerberus AG. Optical smoke detector with contamination detection circuitry. 4,555,634, Cl. 250-565.000.
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Mumford, John L. C.; and Price, Roger F., to TI (Group Services) Limited. Vitreous enamels. 4,555,415, Cl. 427-193.000.
Munakata, Shunsaku; Ukai, Hitoshi; Noguchi, Mitsuru; and Sawai, Shinichi, to Honda Giken Kogyo Kabushiki Kaisha; and Tokyo Seat Co., Ltd. Air-pressure method. 4,555,380, Cl. 264-510.000.
Murai, Bunjirou: *See—*
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Murata Kikai Kabushiki Kaisha: *See—*
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Murray, John H., to Milliken Research Corporation. Encapsulated fiberglass mop handle. 4,554,705, Cl. 16-110.00R.
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Nagai, Satoshi: *See—*
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Nagano, Tamio, to Kabushiki Kaisha Daikin Seisakusho. Damper disc suitable for automobile clutch. 4,555,008, Cl. 192-106.100.
Nagata, Wataru; and Aoki, Tsutomu, to Shionogi & Co., Ltd. Mercaptotetrazolylalkanohydroxamic acids, salts and ester thereof. 4,555,578, Cl. 548-251.000.
Nagel, James H., Jr. Tamper-evident resealable cap. 4,555,038, Cl. 215-235.000.
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Nakagome, Hideki; and Yasuda, Satoshi, to Kabushiki Kaisha Toshiba. Magnetic refrigerating apparatus. 4,554,790, Cl. 62-3.000.
Nakamura, Koichi; Ishibashi, Masashi; Kameda, Hideki; and Makiyo, Minoru, to Fujikura Ltd. Heat shrinkable magnetic shielding article. 4,555,422, Cl. 428-36.000.
Nakamura, Koki: *See—*
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Nakamura, Minoru: *See*—
Asami, Kazuto; Baba, Takao; Nakamura, Minoru; and Tanaka, Mitsuaki, 4,554,775, Cl. 53-64.000.

Nakamura, Ryuji; and Hayashi, Masaharu, to Aisin Seiki Kabushiki Kaisha. Temperature responsive fluid coupling device. 4,555,004, Cl. 192-58.00B.

Nakao, Kenji: *See*—
Koga, Yoshiro; and Nakao, Kenji, 4,555,751, Cl. 363-44.000.

Nakao, Sho: *See*—
Shiba, Keisuke; Fuchizawa, Tetsuro; Nakao, Sho; and Ohishi, Chikashi, 4,555,461, Cl. 430-49.000.

Nakayama, Kazuo: *See*—
Sakuragi, Toshio; Nakayama, Kazuo; Sato, Masaaki; and Koike, Mitsuhiro, 4,554,835, Cl. 73-640.000.

Nalco Chemical Company: *See*—
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,555,558, Cl. 526-287.000.
Sykes, Robert C.; Connelly, Lawrence J.; and Roe, William J., 4,555,329, Cl. 209-5.000.

Nalder, William W.: *See*—
Garner, Alfred V.; and Nalder, William W., 4,555,352, Cl. 252-35.000.

Namiki, Yasuomi, to Victor Company of Japan. Noise reduction by linear interpolation using a single sample-and-hold circuit. 4,555,669, Cl. 330-149.000.

Namizuka, Toshio: *See*—
Ueda, Akio; Akita, Shuichi; and Namizuka, Toshio, 4,555,547, Cl. 525-237.000.

Napoli, Phillip D.; and Patterson, William R., to General Electric Company. Seal cooling apparatus. 4,554,789, Cl. 60-751.000.

Nara, Hirotoshi, to Clarion Co., Ltd. Auto device mounting structure. 4,555,080, Cl. 248-27.100.

Narukawa, Hiroshi: *See*—
Ueeda, Ryuhei; Fujii, Kiyonobu; and Narukawa, Hiroshi, 4,555,439, Cl. 428-221.000.

Narusawa, Toshiaki: *See*—
Okada, Seiji; Watanabe, Isao; Sawatari, Norio; Saito, Kazumasa; Narusawa, Toshiaki; and Okuyama, Hirofumi, 4,555,466, Cl. 430-106.600.

Nash, Randy D., to AT&T Bell Laboratories. Integrated circuit devices for secure data encryption. 4,555,591, Cl. 178-22.130.

National Distillers and Chemical Corporation: *See*—
Maringer, Melvin F.; and Morgan, Fred K., 4,555,379, Cl. 264-310.000.

National Gypsum Company: *See*—
Anders, Dennis F., 4,554,770, Cl. 52-207.000.

National Research Development Corporation: *See*—
Banister, Arthur J.; Hauptman, Zdenek V.; and Kendrick, Aidan G., 4,555,316, Cl. 204-59.00R.

Nawata, Yoshiaki; and Tanimoto, Yasufumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Pulse motor driving apparatus. 4,555,653, Cl. 318-696.000.

NCR Canada Ltd.-NCR Canada Ltee: *See*—
Brooks, Ralf M.; and Lepic, Daniel A., 4,555,617, Cl. 235-379.000.

NCR Corporation: *See*—
Fukuju, Osamu; Inagaki, Yasuhiro; and Minoshima, Katsuji, 4,555,104, Cl. 271-228.000.

Neal, Hubert W. T., to SKF (U.K.) Limited. Bearing and seal assembly. 4,555,188, Cl. 384-482.000.

Nebe, William J.: *See*—
Dueber, Thomas E.; and Nebe, William J., 4,555,473, Cl. 430-281.000.

NEC Corporation: *See*—
Hada, Hiroshi; and Hirayama, Tsutomu, 4,555,641, Cl. 307-254.000.

Neese, Wayne E.; and Stepan, William E., to GTE Communication Systems Corporation. Contact terminal device for connecting hybrid circuit modules to a printed circuit board. 4,555,151, Cl. 339-17.0CF.

Negishi, Kiyoshi: *See*—
Wakui, Yoshio; Negishi, Kiyoshi; and Tano, Eiichi, 4,555,170, Cl. 354-470.000.

Negoro, Ikuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens barrel for variable magnification type copying machine. 4,555,165, Cl. 350-429.000.

Nemoto, Akira, to Japan. Vehicle seat. 4,555,140, Cl. 297-452.000.

Nemoto, Akira, to Tachikawa Spring Co. Ltd. Vehicle seat. 4,555,141, Cl. 297-452.000.

Nesvit, Vasily A.: *See*—
Vasiliev, Leonard L.; Kiselev, Vladimir G.; Morgun, Valery A.; Marchenko, Anatoly M.; Rudnev, Evgeny A.; Nesvit, Vasily A.; Dunaevsky, Leonid M.; Tverdokhleb, Nikolai F.; Bogdanov, Vladimir M.; and Rabetsky, Mikhail I., 4,554,966, Cl. 165-104.210.

Netter, Zvi: *See*—
Fenster, Paul; Netter, Zvi; and Shimoni, Yair, 4,555,728, Cl. 358-111.000.

Neville, Richard E., to AMF Incorporated. Tobacco opening and conditioning apparatus. 4,554,933, Cl. 131-304.000.

New England Digital Corporation: *See*—
Alonso, Sydney A.; and Jones, Cameron W., 4,554,855, Cl. 84-122.000.

New England Mfg. Co.: *See*—
Hewitt, Edward G.; and Pasquale, William D., 4,555,026, Cl. 206-521.000.

New High Glass: *See*—
Campello, Ugo; Racca, Enrico; Sosta, Pierluigi; and Baggiolini, Deris, 4,555,020, Cl. 206-235.000.

Newman, William E., Sr.; and Farrow, Desmond J., Sr. Tankless friction boiler system. 4,554,906, Cl. 122-26.000.

Nghiem, Xuan L.: *See*—
Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., 4,554,965, Cl. 165-95.000.

Nguyen, Khoa D.: *See*—
Karnes, Roy E., Jr.; McCaskill, Rex A.; and Nguyen, Khoa D., 4,555,773, Cl. 364-900.000.

Nickel, William H.: *See*—
Weigand, Francis K.; and Nickel, William H., 4,554,784, Cl. 60-39.020.

Nicolas, Edgard; and Merckaert, Louis, to Solvay & Cie. Cathode for the electrolytic production of hydrogen and its use. 4,555,317, Cl. 204-129.000.

Nicolosi, Carl T.; Nicolosi, Thomas F.; and McCreedy, Ryan D. Multifunction vehicular gear shift lever for snowplow operation. 4,554,751, Cl. 37-234.000.

Nicolosi, Thomas F.: *See*—
Nicolosi, Carl T.; Nicolosi, Thomas F.; and McCreedy, Ryan D., 4,554,751, Cl. 37-234.000.

Nielsen, Margaret J. Massaging tool and method for lower-eyelids and zygomatic skin. 4,554,911, Cl. 128-57.000.

Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; Sanders, Georgius B. J.; and van Nieuwland, Jacob M., to U.S. Philips Corporation. Hybrid loudspeaker system for converting digital signals to acoustic signals. 4,555,797, Cl. 381-117.000.

Nifco Inc.: *See*—
Osada, Hiroshi, 4,555,589, Cl. 174-156.000.

Niigata Kisetsu Kabushiki Kaisha: *See*—
Awano, Koichi; Nitta, Yoshifumi; and Ibe, Satoshi, 4,554,964, Cl. 165-39.000.

Nikaido, Teruo, to Tomy Kogyo Company, Incorporated. Walking and rolling toy. 4,555,237, Cl. 446-355.000.

Nimon, Susan K.: *See*—
Kochte, Werner W.; and Nimon, Susan K., 4,554,702, Cl. 15-372.000.

Nippon Electric Co., Ltd.: *See*—
Sakoe, Hiroaki, 4,555,796, Cl. 381-43.000.

Nippon Furnace Kogyo Kaisha, Ltd.: *See*—
Hasegawa, Toshiaki; and Hirose, Yasuo, 4,554,832, Cl. 73-432.00R.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kato, Mitsumi, 4,554,854, Cl. 84-1.030.
Nishimoto, Tetsuo, 4,554,857, Cl. 84-1.190.
Wachi, Masatada; and Katoh, Mitsumi, 4,554,858, Cl. 84-1.190.

Nippon Kogaku K.K.: *See*—
Iida, Yoshikazu; and Hagyuda, Nobuyoshi, 4,555,648, Cl. 315-241.00P.

Nippon Kokan Kabushiki Kaisha: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,554,897, Cl. 123-188.0AA.
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,554,898, Cl. 123-188.0AA.

Nippon Seiko Kabushiki Kaisha: *See*—
Okoshi, Hideo, 4,554,841, Cl. 74-200.000.

Nippon Soken, Inc.: *See*—
Matsumoto, Muneaki; Kuno, Akira; and Numata, Koji, 4,555,761, Cl. 364-424.000.

Nippon Steel Corporation: *See*—
Takeshita, Takeaki; Oba, Katuyuki; Shimoyama, Yoshiaki; and Masuda, Takashi, 4,555,264, Cl. 75-49.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Orikasa, Wataru; Tochimoto, Kunio; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; and Saito, Hiroshi, 4,555,286, Cl. 156-94.000.
Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.

Nippon Zeon Co. Ltd.: *See*—
Ogura, Shunichiro, 4,555,312, Cl. 203-29.000.
Ueda, Akio; Akita, Shuichi; and Namizuka, Toshio, 4,555,547, Cl. 525-237.000.
Ueda, Akio; Akita, Shuichi; and Chida, Takeshi, 4,555,548, Cl. 525-237.000.

Nippon Zoki Pharmaceutical Co.: *See*—
Hamada, Masaaki; Okamaoto, Kaoru; and Kurosaki, Teikichi, 4,555,513, Cl. 514-311.000.

Nippondenso Co., Ltd.: *See*—
Kato, Hidetoshi; Maruyama, Toshinori; Matsuhashi, Hajime; and Akita, Yoshio, 4,555,657, Cl. 320-64.000.

Nishida, Kenji: *See*—
Baba, Kiyokazu; and Nishida, Kenji, 4,555,012, Cl. 198-621.000.

Nishida, Masamitsu; Ouchi, Hiromu; and Matsuo, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Dielectric ceramic compositions. 4,555,494, Cl. 501-134.000.

Nishihata, Ken; Iinuma, Katsuharu; Yamada, Hitoshi; Hirano, Fumiya; and Tsuruoka, Takashi, to Meiji Seika Kaisha, Ltd. Sodium 7β-(2D-2-amino-2-carboxyethylthioacetamido)-7α-methoxy-3-(1-methyl-1H-tetrazol-5-yl)thiomethyl-3-cephem-4-carboxylate heptahydrate and process for its preparation. 4,555,404, Cl. 514-201.000.

Nishiike, Naritoshi; Nishimaki, Takashi; Miura, Yasushi; and Kumamura, Masaaki, to Sumitomo Heavy Industries, Ltd. Apparatus for automatically exchanging die for injection molding. 4,555,228, Cl. 425-185.000.

Nishikawa, Mitsuyo; and Kurihara, Nobuo, to Hitachi, Ltd. Combustion state diagnostic method. 4,555,800, Cl. 382-25.000.

Nishimaki, Takashi: *See*—
Nishiike, Naritoshi; Nishimaki, Takashi; Miura, Yasushi; and Kumamura, Masaaki, 4,555,228, Cl. 425-185.000.

Nishimoto, Tetsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of varying a tone synthesis operation algorithm. 4,554,857, Cl. 84-1.190.

Nishiura, Masaharu: *See*—
Fujisawa, Hakubun; Nishiura, Masaharu; Haruki, Hiromu; and Uchida, Yoshiyuki, 4,555,636, Cl. 250-578.000.

Nishizawa, Tsutomu: *See*—
Yamada, Yasuyuki; Tanaka, Tadaaki; Tukahara, Ryoichi; and Nishizawa, Tsutomu, 4,555,355, Cl. 252-299.100.

Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,554,891, Cl. 123-41.210.
Hayashi, Yoshimasa, 4,555,240, Cl. 474-152.000.
Yanagishima, Takayuki; and Seko, Yasutoshi, 4,555,694, Cl. 340-524.000.

Nisshin Flour Milling Co., Ltd.: *See*—
Tahara, Yoshiyuki; Takahashi, Toshihiro; Koyama, Hiroyasu; Suzuki, Yoshikuni; and Yasuda, Masatoshi, 4,555,365, Cl. 260-404.000.

Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo; and Miyazaki, Kazuo, 4,554,786, Cl. 60-397.000.

Nitro Nobel AB: *See*—
Persson, Per I.; and Persson, Bengt, 4,555,053, Cl. 228-107.000.

Nitschmann, Karl; Dolata, Hans; and Dietzsch, Gunter, to Andreas Stihl. Safety arrangement for a saw chain of a power-driven chain saw. 4,554,853, Cl. 83-522.000.

Nitta, Yoshifumi: *See*—
Awano, Koichi; Nitta, Yoshifumi; and Ibe, Satoshi, 4,554,964, Cl. 165-39.000.

Nitto Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamada, Hideaki; and Ryuno, Koitchiro, 4,555,487, Cl. 435-253.000.

Nitto Kohki Co., Ltd.: *See*—
Takahashi, Shiro, 4,555,203, Cl. 408-119.000.

Nixon, Richard G., to Allied Corporation. Dispensed guided submunition. 4,554,871, Cl. 102-489.000.

Nixon, Robert J., Jr. Multi-segment seal ring for rotary equipment. 4,554,748, Cl. 34-242.000.

NJM, Inc.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., 4,555,299, Cl. 156-552.000.

Noell, Ralph B.: *See*—
Womack, Darryl L.; Noell, Ralph B.; and Bradshaw, Larry R., 4,554,913, Cl. 128-80.00C.

Noguchi, Mitsuru: *See*—
Munakata, Shunsaku; Ukai, Hitoshi; Noguchi, Mitsuru; and Sawai, Shinichi, 4,555,380, Cl. 264-510.000.

Nojima, Yasuhiro: *See*—
Toyooka, Eietsu; Tomishima, Yoshio; and Nojima, Yasuhiro, 4,555,555, Cl. 526-62.000.

Noranda Metal Industries, Inc.: *See*—
Carnavos, Theodore C., 4,554,969, Cl. 165-154.000.

Nordlof, Richard D. Stock reel dancer. 4,555,071, Cl. 242-75.500.

Norris, Charles H., Jr.: *See*—
Marwah, Ashok K.; and Norris, Charles H., Jr., 4,554,771, Cl. 52-221.000.

North American Philips Corporation: *See*—
Arnold, Emil; Baumgart, Helmut; and Rossi, Barbara A., 4,555,300, Cl. 156-613.000.

Northern Telecom Limited: *See*—
Garner, John N., 4,554,782, Cl. 57-66.000.

Northrop Corporation: *See*—
Cohn, David B.; and Conley, Eugene E., 4,555,787, Cl. 372-86.000.

Norton, Gary E.: *See*—
LaRossa, Denise D.; Thunberg, Allen L.; Norton, Gary E.; and Dappen, Glen M., 4,555,484, Cl. 435-21.000.

Nozaka, Yoshiki, to Dai Nippon Insatsu Kabushiki Kaisha. Method of and device for preparing paper rolls for rotary presses and the like. 4,555,288, Cl. 156-191.000.

Nozaki, Nobuharu: *See*—
Kido, Keishiro; Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,555,464, Cl. 430-67.000.

NSK-Warner K.K.: *See*—
Kawai, Osamu; and Ono, Katsuyasu, 4,555,074, Cl. 242-107.40A.
Kawai, Osamu, 4,555,127, Cl. 280-806.000.

Nugent, Edward L.; and Lutkowski, Lawrence, to Becton, Dickinson and Company. Pour spout for container with improved pouring feature. 4,555,336, Cl. 210-232.000.

Nugent, Edward L., to Becton, Dickinson and Company. Pour spout for a container with improved screening feature. 4,555,341, Cl. 210-359.000.

Numata, Koji: *See*—
Matsumoto, Muneaki; Kuno, Akira; and Numata, Koji, 4,555,761, Cl. 364-424.000.

Numata, Tatsuo, to Pioneer Electronic Corporation. Circuit for driving a signal meter for a receiver. 4,555,671, Cl. 330-252.000.

Nun, Emmanuel B.; Izhar, Rafi; and Karpol, Avner, to Optrotech Ltd. Optical scanning apparatus. 4,555,727, Cl. 358-106.000.

Nunberg, Jack: *See*—
Bahl, Chander P.; and Nunberg, Jack, 4,555,486, Cl. 435-91.000.

Nunn, Gary F., to Du Pont de Nemours, E. I., and Company. Apparatus for tensioning and forwarding tow. 4,554,716, Cl. 28-263.000.

Nutech Energy Systems, Inc.: *See*—
Lewis, James H., 4,554,719, Cl. 29-157.30R.

Nye, Gerald P., Jr. Golf club grip cleaner. 4,554,696, Cl. 15-21.00D.

Nyman, Sigurd: *See*—
Jonsson, Arne; Nyman, Sigurd; Olelind, Eskil K.; and Olofsson, Bjorn, 4,555,218, Cl. 416-17.000.

O. I. Corporation: *See*—
Hall, Randall C., 4,555,383, Cl. 422-89.000.

Oba, Katuyuki: *See*—
Takeshita, Takeaki; Oba, Katuyuki; Shimoyama, Yoshiaki; and Masuda, Takashi, 4,555,264, Cl. 75-49.000.

Obata, Keigo; Dohi, Nobuyasu; Okuhama, Yoshiaki; Masaki, Seishi; Okada, Yukiyoshi; and Yoshida, Tadashi. Tin-lead alloy plating bath. 4,555,314, Cl. 204-44.400.

Obersteiner, Georg: *See*—
Budecker, Ludwig; and Obersteiner, Georg, 4,555,223, Cl. 417-462.000.

Obrecht, Georges, to Alsthom-Atlantique. Oscillating friction ring assembly for applying axial thrust to a shaft. 4,554,983, Cl. 175-107.000.

O'Brien, William J., to Breville Holdings Pyt. Limited. Electrically heated wok. 4,555,616, Cl. 219-432.000.

Ochiai, Kuniaki, to Tokyo Electric Co., Ltd. Release type dot printer head. 4,555,192, Cl. 400-124.000.

Oda, Yoshifumi, to Chisso Corporation. Sustained-release vasodilator. 4,555,398, Cl. 424-19.000.

Odawara, Kazuharu; and Tago, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical disk having elastic deformable spacer. 4,555,716, Cl. 346-137.000.

O'Dea, Orrin B., to Microcommunications, Inc. Electronic telephone relay. 4,555,593, Cl. 179-18.0GD.

O'Dowd, Dennis H.; and Barry, George W. J. Iodine disinfection dispenser. 4,555,347, Cl. 210-752.000.

Oe, Takanori: *See*—
Goto, Kazuhiro; Yaoka, Osamu; and Oe, Takanori, 4,555,510, Cl. 514-291.000.

Oelering, Werner: *See*—
Leifeld, Ferdinand; Coenen, Rolf; Oelering, Werner; and Klopp, Ludwig, 4,554,708, Cl. 19-80.00R.

Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Photoconductive member of amorphous silicon. 4,555,465, Cl. 430-95.000.

Ogino, Yoshio: *See*—
Mizukawa, Takumi; Ogino, Yoshio; Ohmori, Hideki; and Sato, Taketoshi, 4,555,608, Cl. 219-10.770.

Ogorek, Kurt: *See*—
Holz, Joachim; Meier, Wolfgang; Schwarting, Karl-Heinz; Goris, Heinrich; and Ogorek, Kurt, 4,555,142, Cl. 299-43.000.

Oguchi, Yoshihiro: *See*—
Katagiri, Kazuharu; and Oguchi, Yoshihiro, 4,555,472, Cl. 430-278.000.

Ogura, Shunichiro, to Nippon Zeon Co. Ltd. Process for separating highly pure butene-1 or butene-1/isobutene mixture from C_4 hydrocarbon fraction. 4,555,312, Cl. 203-29.000.

O'Hara, John F., Jr.: *See*—
Friedes, Albert; Greene, Thomas V.; Idenden, Frederick W.; Moeller, Kenneth L.; Musen, Robert M.; and O'Hara, John F., Jr., 4,555,594, Cl. 179-18.00B.

Ohara, Makoto: *See*—
Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.

Ohara, Minoru: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohara, Minoru; and Ando, Takao, 4,555,505, Cl. 514-42.000.

Ohara, Terumi: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; Kiuchi, Tsutomu; and Kitamura, Hiroki, 4,555,714, Cl. 346-76.0PH.

Ohgami, Masaaki; Hara, Kazuo; and Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Engine speed control system. 4,555,762, Cl. 364-431.090.

Ohguro, Tamotsu: *See*—
Hiroyasu, Minoru; Yamashita, Hideo; Ohguro, Tamotsu; Yamagishi, Shigeru; and Shino, Shigenari, 4,555,205, Cl. 408-150.000.

Ohishi, Chikashi: *See*—
Shiba, Keisuke; Fuchizawa, Tetsuro; Nakao, Sho; and Ohishi, Chikashi, 4,555,461, Cl. 430-49.000.

Ohki, Kouichi: *See*—
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,555,801, Cl. 382-44.000.

Ohmori, Hideki: *See*—
Mizukawa, Takumi; Ogino, Yoshio; Ohmori, Hideki; and Sato, Taketoshi, 4,555,608, Cl. 219-10.770.

Ohmura, Jukichi: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,555,369, Cl. 260-544.00F.

Ohmura, Yoshio: *See*—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohara, Minoru; and Ando, Takao, 4,555,505, Cl. 514-42.000.

Ohno, Jiro: *See*—
Shimazaki, Fumio; Asai, Koji; and Ohno, Jiro, 4,555,113, Cl. 273-80.00B.

Ohta, Takanori: *See*—
Hayashi, Takehiko; Ikuta, Hiroyuki; and Ohta, Takanori, 4,554,811, Cl. 72-110.000.

Ohtaka, Keiji: *See*—
Suda, Yasuo; Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; and Ohtaka, Keiji, 4,555,169, Cl. 354-407.000.

Oike, Ikuo, to Honda Giken Kogyo Kabushiki Kaisha. Engine exhaust apparatus. 4,554,785, Cl. 60-314.000.

Ok Tedi Mining Limited: *See*—
Stone, Alan M., 4,555,385, Cl. 423-30.000.

Oka, Hitoshi: *See*—
Tanaka, Isamu; Kikuchi, Hiroshi; Tomizawa, Akira; and Oka, Hitoshi, 4,555,532, Cl. 523-400.000.

Okada, Seiji; Watanabe, Isao; Sawatari, Norio; Saito, Kazumasa; Narusawa, Toshiaki; and Okuyama, Hirofumi, to Fujitsu Limited. Developer comprising a carrier coated with Fe_3O_4 dispersed in a butadiene polymer, and a toner. 4,555,466, Cl. 430-106.600.

Okada, Yukiyoshi: *See*—
Obata, Keigo; Dohi, Nobuyasu; Okuhama, Yoshiaki; Masaki, Seishi; Okada, Yukiyoshi; and Yoshida, Tadashi, 4,555,314, Cl. 204-44.400.

Okamaoto, Kaoru: *See*—
Hamada, Masaaki; Okamaoto, Kaoru; and Kurosaki, Teikichi, 4,555,513, Cl. 514-311.000.

Okamoto, Hiromi: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,554,897, Cl. 123-188.0AA.
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,554,898, Cl. 123-188.0AA.

Okamoto, Yoshio: *See*—
Yuki, Heimei; and Okamoto, Yoshio, 4,555,574, Cl. 546-342.000.

Okazaki, Masaki: *See*—
Inoue, Noriyaki; Okazaki, Masaki; Yamamuro, Kiyohiko; and Takei, Haruo, 4,555,482, Cl. 430-574.000.
Sakai, Nobuo; Okazaki, Masaki; and Inagaki, Yoshio, 4,555,479, Cl. 430-372.000.
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; and Toya, Ichizo, 4,555,481, Cl. 430-550.000.

Okimoto, Haruo; and Matsuda, Ikuo, to Mazda Motor Corporation. Engine intake system. 4,554,890, Cl. 123-26.000.

Okoshi, Hideo, to Nippon Seiko Kabushiki Kaisha. Speed control device of a toric type infinitely variable transmission. 4,554,841, Cl. 74-200.000.

Okubo, Yasuo: *See*—
Asano, Juichi; Okubo, Yasuo; Saito, Hiroshi; and Harada, Shigeru, 4,555,064, Cl. 241-89.300.

Okuhama, Yoshiaki: *See*—
Obata, Keigo; Dohi, Nobuyasu; Okuhama, Yoshiaki; Masaki, Seishi; Okada, Yukiyoshi; and Yoshida, Tadashi, 4,555,314, Cl. 204-44.400.

Okuno, Yoshiomi: *See*—
Arimura, Hirofumi; Uemura, Yahiro; and Okuno, Yoshiomi, 4,555,401, Cl. 424-89.000.

Okuyama, Hirofumi: *See*—
Okada, Seiji; Watanabe, Isao; Sawatari, Norio; Saito, Kazumasa; Narusawa, Toshiaki; and Okuyama, Hirofumi, 4,555,466, Cl. 430-106.600.

Olelind, Eskil K.: *See*—
Jonsson, Arne; Nyman, Sigurd; Olelind, Eskil K.; and Olofsson, Bjorn, 4,555,218, Cl. 416-17.000.

Olin Corporation: *See*—
Ashok, Sankaranarayanan; and Breedis, John F., 4,555,272, Cl. 148-3.000.
Winter, Joseph; and Pryor, Michael J., 4,555,054, Cl. 228-148.000.

Ollinger, James C.; and Shaub, Melvin H., to Armstrong World Industries, Inc. Method of reinforcing a ceiling runner. 4,554,718, Cl. 29-155.00R.

Olofsson, Bjorn: *See*—
Jonsson, Arne; Nyman, Sigurd; Olelind, Eskil K.; and Olofsson, Bjorn, 4,555,218, Cl. 416-17.000.

Olympus Optical Co., Ltd.: *See*—
Hanaoka, Naohiro, 4,555,444, Cl. 428-336.000.

Omega SA: *See*—
Vuilleumier, Cyril, 4,555,185, Cl. 368-190.000.

OMI International Corporation: *See*—
Barbieri, Stephen C.; and Mayer, Linda J., 4,555,315, Cl. 204-52.00R.

O'Neal, Keith T.: *See*—
Coy, Calvin L.; and O'Neal, Keith T., 4,554,697, Cl. 15-55.000.

Onkyo Kabushiki Kaisha: *See*—
Koga, Yoshiro; and Nakao, Kenji, 4,555,751, Cl. 363-44.000.

Ono, Katsuyasu: *See*—
Kawai, Osamu; and Ono, Katsuyasu, 4,555,074, Cl. 242-107.40A.

Ono, Takuro, to Aisin Seiki Kabushiki Kaisha. Hydraulic lifter for internal combustion engines. 4,554,895, Cl. 123-90.550.

Op de Beek, Johannes C. A.; and Lobregt, Steven, to U.S. Philips Corporation. Method and computer tomography device for determining a tomographic image with elevated resolution. 4,555,760, Cl. 364-414.000.

Optrotech Ltd.: *See*—
Nun, Emmanuel B.; Izhar, Rafi; and Karpol, Avner, 4,555,727, Cl. 358-106.000.

Orbital Engine Company Proprietary Limited: *See*—
McKay, Michael L., 4,554,945, Cl. 137-312.000.

Orikasa, Wataru; Tochimoto, Kunio; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; and Saito, Hiroshi, to Nippon Telegraph and Telephone Public Corporation; Sho-Bond Construction Co., Ltd.; and Communication Architecture and Building Research Corporation. Apparatus for and a method of repairing by filling with an adhesive. 4,555,286, Cl. 156-94.000.

Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, to Nippon Telegraph and Telephone Public Corporation; Sho-Bond Construction Co., Ltd.; and Communication Architecture and Building Research Corporation. Adhesive filler apparatus. 4,555,295, Cl. 156-349.000.

Orsak, John E.; and Roman, Charles A., to Dayco Corporation. Fragrant wall covering having an emollient moisturizer and a method of making same. 4,555,438, Cl. 428-219.000.

Ortho Pharmaceutical Corporation: *See*—
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,555,571, Cl. 544-286.000.
Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,555,570, Cl. 544-286.000.

Orthoefer, Frank T.: *See*—
Gibson, Paul W.; and Orthoefer, Frank T., 4,555,417, Cl. 427-361.000.

Osada, Hiroshi, to Nifco Inc. Lead wire retainer. 4,555,589, Cl. 174-156.000.

Osawa, Shigeru; and Yamoto, Hisayoshi, to Topy Industries Limited. Wheel rim with split locking ring. 4,554,961, Cl. 152-410.000.

Osterholt, Gerd: *See*—
Bruns, Engelbert; and Osterholt, Gerd, 4,555,308, Cl. 202-263.000.

Osti, Roberto: *See*—
Mattei, Riccardo; and Osti, Roberto, 4,555,281, Cl. 156-64.000.

Ostrander, Charles, to Consolidated Foods Corporation. Slipper. 4,554,749, Cl. 36-102.000.

Otis Engineering Corporation: *See*—
Merritt, David T., 4,554,972, Cl. 166-137.000.

Otto, Lance M. Uneven bars. 4,555,107, Cl. 272-63.000.

Ouchi, Hiromu: *See*—
Nishida, Masamitsu; Ouchi, Hiromu; and Matsuo, Yoshihiro, 4,555,494, Cl. 501-134.000.

Oude Alink, Bernardus A., to Petrolite Corporation. 4,5-Dihydrothiazoles and preparation thereof. 4,555,576, Cl. 548-146.000.

Outboard Marine Corporation: *See*—
DuBois, Chester G., 4,555,221, Cl. 417-349.000.

Over, William R.; Wion, Donald A.; and Heffner, Richard M., to AMP Incorporated. Modular lead maker. 4,554,725, Cl. 29-564.400.

Overholt, Mark. System for operation of a direct drive dual drum winch. 4,555,092, Cl. 254-291.000.

Overley, Ronald V.; Tedhams, Michael H.; and Atzbach, Carl L., to Whirlpool Corporation. Latch for self-cleaning oven door. 4,554,907, Cl. 126-191.000.

Owens-Corning Fiberglas Corporation: *See*—
Sieloff, Ronald F.; and Kays, William A., 4,555,447, Cl. 428-392.000.

Owens-Illinois, Inc.: *See*—
Burtch, John E.; and Hill, James A., 4,555,296, Cl. 156-446.000.

P.S.R., Incorporated: *See*—
Cusumano, Salvatore V.; and Glassman, Aaron, 4,554,877, Cl. 112-105.000.

PA Incorporated: *See*—
Stanley, Roderic K.; Milewits, Marvin; Knauer, Robert C., Jr.; and Bradfield, James E., 4,555,665, Cl. 324-229.000.

Packard Instrument Company, Inc.: *See*—
Everett, Leroy J.; and DeFilippis, Stanley J., 4,555,629, Cl. 250-362.000.

Palara, Sergio; and Torazzina, Aldo, to SGS-ATES Componenti Elettronici S.p.A. Power audio-amplifier with automatic adjustment of the bias current absorbed by the final stage. 4,555,674, Cl. 330-267.000.

Pali, Christopher, to Essex Group, Inc. Method and apparatus for unwinding and splicing successive rolls. 4,555,070, Cl. 242-58.100.

Pallanch, Francis T., to Vilter Manufacturing Corporation. Multi-stage gas compressor system and desuperheater means therefor. 4,554,799, Cl. 62-509.000.

Palumbo, Janice M.: *See*—
Reczek, James A.; and Palumbo, Janice M., 4,555,478, Cl. 430-367.000.

Panduit Corp.: *See*—
Caveney, Jack E., 4,554,733, Cl. 29-749.000.

Paoluccio, John A. Sediment dike apparatus and methods. 4,555,201, Cl. 405-117.000.

Parrillo, Louis C.: *See*—
Hillenius, Steven J.; and Parrillo, Louis C., 4,554,726, Cl. 29-571.000.

Pasquale, William D.: *See*—
Hewitt, Edward G.; and Pasquale, William D., 4,555,026, Cl. 206-521.000.

Pasternak, Stephen F.; and Wohrstein, Franz X., to Peerless of America, Inc. Heat exchangers and method of making same. 4,554,970, Cl. 165-181.000.

Pastors, Debbie, executrix: *See*—
Foley, Robert W.; Storck, Robert C.; Mickus, Donald J., deceased; and Pastors, Debbie, executrix, 4,554,979, Cl. 172-813.000.

Patchett, Arthur A.; and Wu, Mu T., to Merck & Co., Inc. Aminoacyl-containing dipeptide derivatives useful as antihypertensives. 4,555,502, Cl. 514-19.000.

Patchett, Arthur A., to Merck & Co., Inc. N^2-(Substituted)carboxymethyl-N^6-(substituted)-lysyl-and α-(ε-aminoalkyl)glycyl amino acid antihypertensive agents. 4,555,503, Cl. 514-19.000.

Patel, Nathalal G.: *See*—
Lockard, Walter G.; Patel, Nathalal G.; and Boris, Allen J., 4,555,121, Cl. 280-30.000.
Patel, Parbhubhai D.: *See*—
Gardner, William B.; Patel, Parbhubhai D.; Philen, Dan L.; and Santana, Manuel R., 4,555,175, Cl. 356-32.000.
Patel, Raman, to Monsanto Company. Compatibilized blends of acrylic ester. 4,555,546, Cl. 525-194.000.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,555,552, Cl. 525-456.000.
Patterson, William R.: *See*—
Napoli, Phillip D.; and Patterson, William R., 4,554,789, Cl. 60-751.000.
Patton, John T., Jr.; and Rupert, John P., to BASF Wyandotte Corporation. Halogenated phenolic polyols and rigid cellular compositions made therefrom. 4,555,530, Cl. 521-131.000.
Paus, Lloyd L., to Huck Manufacturing Company. Fastener tester. 4,554,838, Cl. 73-761.000.
Pavlick, Michael J.: *See*—
Dickhart, William W., III; Graziani, Dante J., Jr.; Herring, James M., Jr.; Pavlick, Michael J.; and Renn, Edward J., 4,555,095, Cl. 267-4.000.
Peacock, Glenn S.: *See*—
Koleske, Joseph V.; Peacock, Glenn S.; and Kwiatkowski, George T., 4,555,449, Cl. 428-411.100.
Pearo, John M. Tamper-proof pill dispenser. 4,555,044, Cl. 221-19.000.
Peerless of America, Inc.: *See*—
Pasternak, Stephen F.; and Wohrstein, Franz X., 4,554,970, Cl. 165-181.000.
Pehkonen, Robert: *See*—
Yoakam, David; Campbell, Robert; and Pehkonen, Robert, 4,554,887, Cl. 118-666.000.
Pejouhy, Radi; and Cardin, Wilfred W., to Texas Instruments Incorporated. Snap-acting thermostatic switch assembly. 4,555,686, Cl. 337-102.000.
Perego, Lucio C.: *See*—
Harrod, Lawrence R.; and Perego, Lucio C., 4,555,451, Cl. 429-1.000.
Performance Pool Products, Ltd.: *See*—
Cohen, Joseph D., 4,555,334, Cl. 210-169.000.
Peritz, Lyonel: *See*—
Grollier, Jean-Francois; Monnais, Christian; and Peritz, Lyonel, 4,555,246, Cl. 8-405.000.
Perkin-Elmer Corporation, The: *See*—
Garcia, Enrique, 4,555,733, Cl. 358-293.000.
Persson, Bengt: *See*—
Persson, Per I.; and Persson, Bengt, 4,555,053, Cl. 228-107.000.
Persson, Per I.; and Persson, Bengt, to Nitro Nobel AB; and AB Volvo. Method of joining together two pipe ends to form a pipe of metal. 4,555,053, Cl. 228-107.000.
Peter, Joseph E.: *See*—
Collins, C. Neal; and Peter, Joseph E., 4,555,059, Cl. 239-425.000.
Petersen, Wallace C., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,555,261, Cl. 71-90.000.
Petrillo, Edward W., Jr.: *See*—
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,555,506, Cl. 514-91.000.
Petrolite Corporation: *See*—
Oude Alink, Bernardus A., 4,555,576, Cl. 548-146.000.
Petry, Eston F.: *See*—
Coon, Julian B.; and Petry, Eston F., 4,554,941, Cl. 137-240.000.
Peyton, Jeffrey L. Hand actuated puppet and kit. 4,555,236, Cl. 446-329.000.
Pfizer Inc.: *See*—
Cross, Peter E.; and Dickinson, Roger P., 4,555,516, Cl. 514-326.000.
Pfyl, Walter: *See*—
Hausler, Michael; Huber, Philippe; Pfyl, Walter; and Sadek, Kadry, 4,555,658, Cl. 323-210.000.
Phelps, Mary E.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Lee, Seok H.; and Phelps, Mary E., 4,555,364, Cl. 260-397.200.
Philen, Dan L.: *See*—
Gardner, William B.; Patel, Parbhubhai D.; Philen, Dan L.; and Santana, Manuel R., 4,555,175, Cl. 356-32.000.
Phillips, Howard L. Split engine clutch. 4,555,003, Cl. 192-53.00B.
Phillips Petroleum Company: *See*—
Agapiou, Agapios; Allan, John L. H.; and Jacobson, Felix I., 4,555,496, Cl. 502-105.000.
Jain, Gyan P., 4,555,309, Cl. 203-1.000.
Kukes, Simon G.; and Kimble, James B., 4,555,499, Cl. 502-208.000.
Kukes, Simon G., 4,555,500, Cl. 502-334.000.
Marrelli, Ronald E., 4,555,310, Cl. 203-10.000.
Picker International, Ltd.: *See*—
Young, Ian R., 4,554,925, Cl. 128-653.000.
Pickering, William: *See*—
Melocik, Grant C.; and Pickering, William, 4,555,651, Cl. 318-341.000.
Pigeon, Michel: *See*—
David, Bernard; and Pigeon, Michel, 4,555,664, Cl. 324-225.000.
Pike, Robert C., to AT&T Bell Laboratories. Dynamic generation and overlaying of graphic windows for multiple active program storage areas. 4,555,775, Cl. 364-900.000.
Pines of America, Inc.: *See*—
Harrod, Lawrence R.; and Perego, Lucio C., 4,555,451, Cl. 429-1.000.
Pino y Torres, Jose L. Vaginal applicator. 4,554,909, Cl. 128-1.200.
Pioneer Electronic Corporation: *See*—
Numata, Tatsuo, 4,555,671, Cl. 330-252.000.
Pioneer Video Corporation: *See*—
Katsuyama, Hitoshi, 4,555,679, Cl. 331-17.000.
Pirdzun, Jorg: *See*—
Evertz, Egon; and Pirdzun, Jorg, 4,555,094, Cl. 266-45.000.
Piwinski, John J.: *See*—
Suh, John T.; Regan, John R.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,555,508, Cl. 514-211.000.
Platter, Sanford; Durand, Charles A.; and Gadsby, Larry R., to Electronic Processors, Inc. Tape cartridge. 4,555,077, Cl. 242-198.000.
Plessey Overseas Limited: *See*—
Rex, Michael P., 4,554,873, Cl. 104-88.000.
Ploch, Siegfrid; Rossler, Sonja; Zeisberg, Peter; and Heilmann, Horst, to VEB Kombinat Textima. Apparatus and method for the production of textile surface configurations. 4,554,804, Cl. 66-214.000.
Ploppa, Jurgen: *See*—
Goller, Ernst; Ploppa, Jurgen; and Walker, Fritz, 4,554,802, Cl. 66-71.000.
Plug-In Storage Systems, Inc.: *See*—
Maroney, Ralf P.; and Fishkind, Gregory A., 4,555,744, Cl. 361-212.000.
Plummer, Jeffrey J., to Ex-Cell-O Corporation. Cable pulling device with force indicator and overload protection. 4,555,093, Cl. 254-362.000.
Plummer, Mark A., to Marathon Oil Company. Cracking with tetrachloroaluminate catalysts and water. 4,555,327, Cl. 208-108.000.
Poate, John M.: *See*—
Gibson, John M.; Jacobson, Dale C.; Poate, John M.; and Tung, Raymond T., 4,555,301, Cl. 156-617.00R.
Poggio, Cesare: *See*—
Alaria, Gian B.; Appiano, Silvano; Destefanis, Paolo; and Poggio, Cesare, 4,555,782, Cl. 370-104.000.
Pohl, Gerhard: *See*—
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,554,715, Cl. 28-107.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,424, Cl. 428-91.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,425, Cl. 428-91.000.
Polad, Michael D.; Gerlach, LeRoy E.; and Schmidt, Robert H., to Data Card Corporation. Laser machining system. 4,555,610, Cl. 219-121.0LA.
Polaroid Corporation: *See*—
Zinchuk, Michael, 4,555,731, Cl. 358-209.000.
Polyonics Corporation: *See*—
Hoover, Merwin F.; Salamone, Ann B.; and Vandebult, Jan, 4,555,414, Cl. 427-43.100.
Polyplastics Company, Ltd.: *See*—
Kausga, Takuzo; Ikenaga, Yukio; and Suzuki, Kunio, 4,555,357, Cl. 252-511.000.
Polytel Corp.: *See*—
Danish, Sherif; and Danish, Adel, 4,555,693, Cl. 340-365.00S.
Pompier, Jean-Pierre, to Compagnie Generale des Etablissments Michelin. Radial carcass tire which can be particularly used without an independent inner tube. 4,554,960, Cl. 152-450.000.
Ponant, Jacques, to Union Nationale des Cooperatives Agricoles de Transformation de la Betterave. Beet juice extracting process. 4,555,270, Cl. 127-44.000.
Pondes, Alfonsius A. T., to Comato B.V. Tool holder with tool. 4,555,202, Cl. 407-117.000.
Ponzo, Charles. Crab trap. 4,554,760, Cl. 43-105.000.
Poole, Michael R. Device to prevent fuel flow from a fuel tank to an engine. 4,554,946, Cl. 137-384.200.
Popp, William E.: *See*—
Citron, Alan L.; Lindquist, Thomas W. F.; and Popp, William E., 4,555,699, Cl. 340-707.000.
Posselt, Klaus: *See*—
Gruber, Klaus; Lohner, Manfred; Posselt, Klaus; and Wagener, Hans H., 4,555,524, Cl. 514-570.000.
Postel, Lothar: *See*—
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,554,715, Cl. 28-107.000.
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Poteet, Ken A., to Texas Instruments Incorporated. Sense amplifier circuit for dynamic read/write memory. 4,555,777, Cl. 365-205.000.
Power-Aid Industries (1980) Ltd.: *See*—
Garner, Alfred V.; and Nalder, William W., 4,555,352, Cl. 252-35.000.
Power Climber, Inc.: *See*—
May, Marvin M.; Billings, Robert C.; Kendall, Harry A.; and Bayorgeon, Jeffrey T., 4,555,091, Cl. 254-267.000.
PPG Industries, Inc.: *See*—
Chabal, Joseph, 4,554,713, Cl. 26-51.000.
Makhlouf, Joseph M.; McCollum, Gregory J.; and Kerr, Paul R., 4,555,551, Cl. 525-455.000.

Pramskog, Torbjorn: *See*—
Johansson, Borje; Pramskog, Torbjorn; and Sandberg, Jan-Erik, 4,554,860, Cl. 89-1.700.
Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See*—
Ambros, Peter; and Gatzke, Erich, 4,555,533, Cl. 523-440.000.
Westermeir, Gisela; and Fehr, Friedhard, 4,555,745, Cl. 361-320.000.
Press, Jeffery B.: *See*—
Wright, William B., Jr.; and Press, Jeffery B., 4,555,519, Cl. 514-340.000.
Preuk, Gerhard: *See*—
Simon, Fritz; Korber, Klaus; Bandelow, Horst; Scherer, Michael; Wilke, Dieter; Thron, Werner; and Preuk, Gerhard, 4,554,707, Cl. 17-47.000.
Price, Roger F.: *See*—
Mumford, John L. C.; and Price, Roger F., 4,555,415, Cl. 427-193.000.
Pride Machine, Inc.: *See*—
Weishalla, Gale F., 4,554,815, Cl. 72-349.000.
Prigent, Madeleine: *See*—
Bonicel, Jean-Pierre; Prigent, Madeleine; and Cottevieille, Christian, 4,555,539, Cl. 524-127.000.
Prinz, Friedrich B.; Hoburg, James F.; and Gunnarsson, Kristjan, to Carnegie-Mellon University. Acoustic sensor and method of using same for determining the position of a tool relative to a workpiece. 4,554,834, Cl. 73-597.000.
Pritchard, Dalton H., to RCA Corporation. Apparatus for reducing motion induced distortion in a frame combed chrominance signal. 4,555,723, Cl. 358-31.000.
Procter & Gamble Company, The: *See*—
Bissett, Donald L.; and Mao, Mark H. K., 4,555,360, Cl. 252-541.000.
Buell, Kenneth B., 4,555,244, Cl. 604-392.000.
Spendel, Wolfgang U., 4,555,019, Cl. 206-223.000.
Pryor, Marc I., to Ford Motor Company. Pneumatic spring and strut assembly. 4,555,096, Cl. 267-8.00R.
Pryor, Michael J.: *See*—
Winter, Joseph; and Pryor, Michael J., 4,555,054, Cl. 228-148.000.
Prystowsky, Eric N.; and Zipes, Douglas P. Method of inhibiting cardiac arrhythmias. 4,554,922, Cl. 128-419.0PG.
Puccerella, Thomas J. Water saving system. 4,554,688, Cl. 4-191.000.
Puglis, Joseph M.: *See*—
Engel, John F.; and Puglis, Joseph M., 4,555,521, Cl. 514-362.000.
Pullen, Elaine: *See*—
Arway, George; Eremity, Frank; Dick, George; and Pullen, Elaine, 4,555,712, Cl. 346-75.000.
Pullman Standard, Inc.: *See*—
Miller, Roy W., 4,555,033, Cl. 213-51.000.
Purrer, Josef: *See*—
Binder, Berthold; and Purrer, Josef, 4,555,065, Cl. 241-241.000.
Putnam, William M.: *See*—
Barrett, Robert C.; Buscher, John H.; and Putnam, William M., 4,554,738, Cl. 30-275.000.
Quella, Ferdinand; and Steinwender, Bernd, to Siemens Aktiengesellschaft. Method of using a foamable hot-melt adhesive for sealing. 4,555,284, Cl. 156-79.000.
R. J. Reynolds Tobacco Company: *See*—
Conrad, Lucas J.; and White, Jackie L., 4,554,932, Cl. 131-296.000.
R L Associates: *See*—
Riskin, Bernard N., 4,555,618, Cl. 235-384.000.
R. S. Hughes Ind. Inc.: *See*—
Hughes, Robert S., 4,555,138, Cl. 297-346.000.
Raasch, Hans; and Grecksch, Hans, to W. Schlafhorst & Co. Spool transporting device. 4,555,215, Cl. 414-564.000.
Rabe, James A.: *See*—
Lee, Chi-Long; Maxson, Myron T.; and Rabe, James A., 4,555,529, Cl. 521-124.000.
Rabetsky, Mikhail I.: *See*—
Vasiliev, Leonard L.; Kiselev, Vladimir G.; Morgun, Valery A.; Marchenko, Anatoly M.; Rudnev, Evgeny A.; Nesvit, Vasily A.; Dunaevsky, Leonid M.; Tverdokhleb, Nikolai F.; Bogdanov, Vladimir M.; and Rabetsky, Mikhail I., 4,554,966, Cl. 165-104.210.
Racca, Enrico: *See*—
Campello, Ugo; Racca, Enrico; Sosta, Pierluigi; and Baggiolini, Deris, 4,555,020, Cl. 206-235.000.
Raccah, Edward R.; and King, James B. Hair drying apparatus. 4,555,232, Cl. 432-222.000.
Raffaeli, Lidio P., to Stewart-Warner Corporation. Corrosion resistant caster. 4,554,704, Cl. 16-21.000.
Raicu, Dan: *See*—
Sorger, Gunter U.; and Raicu, Dan, 4,555,683, Cl. 333-202.000.
Raidt, Heinz-Peter: *See*—
Jablonka, Dieter; Urban, Klaus; Raidt, Heinz-Peter; and Schepers, Eberhard, 4,555,433, Cl. 428-166.000.
Rainer, Georg, to Byk Gulden Lomberg Chemische Fabrik GmbH. Fluoroalkoxy substituted benzimidazoles useful as gastric acid secretion inhibitors. 4,555,518, Cl. 514-338.000.
Raivel, Earl L., Jr.: *See*—
Berenato, Joseph W., III; Raivel, Earl L., Jr.; and Strepelis, John J., 4,555,209, Cl. 414-163.000.
Ranks Hovis McDougall, PLC: *See*—
Marsh, Robert A., 4,555,485, Cl. 435-68.000.
Ranno, Edward N., Sr. Auxiliary form roller apparatus for rotary offset lithographic duplicating machines. 4,554,869, Cl. 101-145.000.
Rao, S. Prabhakara; and Burkhalter, John F., to Halliburton Company. Hydrolytically stable polymers for use in oil field cementing methods and compositions. 4,555,269, Cl. 106-90.000.
Rathbun, Willard J. Tamper resistant container and closure assembly. 4,555,042, Cl. 220-277.000.
Ray, Hugh C. Underwear. 4,554,685, Cl. 2-403.000.
Raytheon Company: *See*—
Galani, Zvi; Laton, Richard W.; Waterman, Raymond C., Jr.; and DiBiase, Robert, 4,555,678, Cl. 331-1.00A.
Thomas, Calvin J.; and Hurley, James E., 4,555,606, Cl. 219-10.55R.
RCA Corporation: *See*—
Carlson, David J., 4,555,809, Cl. 455-190.000.
Harwood, Leopold A.; and Shanley, Robert L., II, 4,555,722, Cl. 358-17.000.
Lewis, Henry G., Jr.; and Stiller, Thomas M., 4,555,768, Cl. 364-757.000.
Pritchard, Dalton H., 4,555,723, Cl. 358-31.000.
Wagner, Theodor M., 4,555,163, Cl. 350-172.000.
Readhead, John B., to U.S. Philips Corporation. Infra-red radiation detectors and their manufacture. 4,555,720, Cl. 357-30.000.
Reckitt & Colman Products Limited: *See*—
Hammond, Geoffrey R., 4,555,194, Cl. 401-206.000.
Reczek, James A.; and Palumbo, Janice M., to Eastman Kodak Company. Photographic element and process for providing metal complex color images. 4,555,478, Cl. 430-367.000.
Reed Rock Bit Company: *See*—
Jones, Kenneth W., 4,554,986, Cl. 175-397.000.
Reese Scientific Corporation: *See*—
Thomas, Rees D., 4,555,183, Cl. 366-208.000.
Reflexite Corporation: *See*—
Rowland, William P., 4,555,161, Cl. 350-103.000.
Regan, John R.: *See*—
Suh, John T.; Regan, John R.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,555,508, Cl. 514-211.000.
Rehrig, Houston. Protective flange for wheel castor housing. 4,555,123, Cl. 280-160.000.
Reid, Dwight K., to Betz Laboratories, Inc. Methods and compositions for boronizing metallic surfaces. 4,555,326, Cl. 208-48.00R.
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., to Ciba-Geigy Corporation. Benzoate-stabilized rigid polyvinyl chloride compositions. 4,555,541, Cl. 524-180.000.
Reiley, Timothy C.: *See*—
Chance, Dudley A.; Reiley, Timothy C.; and Sampogna, Michael, 4,555,285, Cl. 156-89.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, to VEB Forster Tuchfabriken. Method for the finishing of textile sheets. 4,554,715, Cl. 28-107.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, to VEB Forst. Textile sheet with surface effects. 4,555,424, Cl. 428-91.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, to VEV Forster Tuchfabriken. Textile sheet with specific surface effects. 4,555,425, Cl. 428-91.000.
Remy, Francis: *See*—
Marhic, Gerard; Schaff, Didier; and Remy, Francis, 4,555,609, Cl. 219-121.0PC.
Renn, Edward J.: *See*—
Dickhart, William W., III; Graziani, Dante J., Jr.; Herring, James M., Jr.; Pavlick, Michael J.; and Renn, Edward J., 4,555,095, Cl. 267-4.000.
Rennecker, David B.; and Taylor, Walt S., to Hoover Company, The. Dispensing arrangement for an upright vacuum cleaner. 4,554,698, Cl. 15-339.000.
Repa, Otto, to Carl Walther GmbH. Device for aligning an adjustable sight element in a sight system for rifles. 4,554,745, Cl. 33-257.000.
Repella, James A., to Microdot Inc. Transfer apparatus and method. 4,554,723, Cl. 29-430.000.
Research Corporation: *See*—
Edling, Robert J.; and Morgan, Karl L., 4,554,759, Cl. 43-100.000.
Reuters Ltd.: *See*—
Baldry, Kenneth; and Davids, Martin, 4,555,781, Cl. 370-60.000.
Rex, Michael P., to Plessey Overseas Limited. Material handling and sorting system. 4,554,873, Cl. 104-88.000.
Reyenga, Tjerk: *See*—
Bekkers, Henricus A. M.; and Reyenga, Tjerk, 4,555,036, Cl. 215-220.000.
Reynolds Metals Company: *See*—
Watson, David R.; Carithers, Val G.; and McDaniel, L. Thomas, 4,555,493, Cl. 501-127.000.
Rhees, John T. Tamper evident inner seal for containers. 4,555,037, Cl. 215-232.000.
Ricci, Louis N.: *See*—
Maier, Alfred E.; and Ricci, Louis N., 4,555,604, Cl. 200-255.000.
Rice, M. John, Jr.: *See*—
Legge, Ronald; Rice, M. John, Jr.; and Sarma, Kalluri R., 4,555,303, Cl. 156-643.000.
Richards Medical Company: *See*—
Brumfield, David L., 4,554,915, Cl. 128-92.00A.
Ricoh Company, Ltd.: *See*—
Gojo, Tomomi, 4,555,191, Cl. 400-121.000.
Hashimoto, Mitsuru, 4,555,567, Cl. 534-654.000.
Ishima, Kazumi, 4,555,713, Cl. 346-75.000.

Koide, Hiroshi, 4,555,780, Cl. 369-43.000.
Koike, Takahisa, 4,555,710, Cl. 346-1.100.
Sato, Tsutomu, 4,555,711, Cl. 346-75.000.
Rieke Corporation: *See—*
Hamman, Martin E.; and Baughman, Gary M., 4,555,048, Cl. 222-478.000.
Ries, Donald G.: *See—*
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,555,558, Cl. 526-287.000.
Rifkin, Gary L.; Lawrence, Charles C.; Zilber, Sam; and Hamby, Michael, to General Instrument Corporation. LED Circuit board indicator housing and tie-bar assembly. 4,555,749, Cl. 362-249.000.
Riker Laboratories, Inc.: *See—*
Bronn, William R., 4,555,573, Cl. 546-291.000.
Riom Laboratoires C.E.R.M. "RL-CERM" S.A.: *See—*
Combourieu, Michel; Simond, Jacques A. L.; and Monteil, Andre J., 4,555,514, Cl. 514-343.000.
Riskin, Bernard N., to R L Associates. Method and means for collecting highway tolls. 4,555,618, Cl. 235-384.000.
Ritson, Carl: *See—*
Danby, Hal C.; and Ritson, Carl, 4,554,837, Cl. 73-705.000.
Rixon, Inc.: *See—*
Cressey, John R.; and Meneely, Dennis C., 4,555,667, Cl. 329-50.000.
Robert Bosch GmbH: *See—*
Biermann, Eberhard, 4,554,825, Cl. 73-118.000.
Denk, Josef; Dietrich, Walter; and Weller, Otto, 4,554,777, Cl. 53-201.000.
Engel, Gerhard; and Wessel, Wolf, 4,554,899, Cl. 123-357.000.
Heitmann, Jurgen, 4,555,737, Cl. 360-13.000.
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,555,060, Cl. 239-585.000.
Straubel, Max; and Zimmermann, Klaus-Dieter, 4,554,903, Cl. 123-575.000.
Sumal, Jaihind S., 4,554,829, Cl. 73-204.000.
Roberts, F. Alex, to Chevron Research Company. Submerged marine streamer locator. 4,555,779, Cl. 367-19.000.
Roberts, James K., to Allied Corporation. Overtravel device for an automatic brake adjuster. 4,555,001, Cl. 188-79.5GE.
Robertson, Allan J., to American Cyanamid Company. Process for synthesizing diorganomonothiophosphinates. 4,555,368, Cl. 260-502.40R.
Robinson, Paul R.; and Moorehead, Eric L., to Union Oil Company of California. Process for producing conjugated dienes. 4,555,584, Cl. 585-623.000.
Rock, Erich; and Rupprechter, Helmut, to Julius Blum Gesellschaft m.b.H. Mounting plate of a hinge for mounting a door on furniture frames of varying thickness. 4,554,706, Cl. 16-237.000.
Rockwell International Corporation: *See—*
Anderson, Eric G., 4,555,619, Cl. 235-492.000.
Cassidenti, Michael L., 4,555,204, Cl. 408-144.000.
Hogge, Charles R., Jr., 4,555,789, Cl. 375-11.000.
Mosier, Donald E.; and Cascini, Michael R., 4,555,625, Cl. 250-231.0SE.
Treise, Jan E., 4,555,704, Cl. 343-7.300.
Rockwell-Rimoldi S.p.A.: *See—*
Marchesi, Franco, 4,554,840, Cl. 74-42.000.
Rodgers, Stephen D.; Dick, Richard J.; and McGinnis, Vincent D., to Battelle Development Corporation. Non-emissive, flame-retardant coating compositions. 4,555,366, Cl. 260-404.800.
Rodriguez, David F. Nutcracker. 4,554,736, Cl. 30-120.300.
Rodth, Joseph J.; Smith, Ira A., Jr.; and Cornett, Donald F., to Coca-Cola Company, The. Ice-cooled dispensing system. 4,555,045, Cl. 222-1.000.
Roe, William J.: *See—*
Sykes, Robert C.; Connelly, Lawrence J.; and Roe, William J., 4,555,329, Cl. 209-5.000.
Roentgen, Paul; Krumm, Helmut; Krasborn, Gottfried; and Lenzen, Gunter. Process for installation and removal of glass pane from a frame. 4,555,607, Cl. 219-10.570.
Rogers, Mary L., administrator: *See—*
Rogers, Randall, deceased, 4,554,781, Cl. 56-235.000.
Rogers, Randall, deceased (by Rogers, Mary L., administrator), to Aerial Solutions, Inc. Airborne tree trimmer. 4,554,781, Cl. 56-235.000.
Rogers, Thomas A.: *See—*
Clouthier, Richard S.; and Rogers, Thomas A., 4,555,171, Cl. 355-3.0CH.
Roggenkamp, Hans-Gunther: *See—*
Kiesewetter, Holger; Jung, Friedrich; and Roggenkamp, Hans-Gunther, 4,554,821, Cl. 73-55.000.
Rohde & Schwarz GmbH & Co. KG: *See—*
Lange, Wolf-Ruediger; Wessel, Anton; Bohler, Udo; Volkheimer, Klaus; Greiner, Gunter; and Islet, Peter, 4,555,806, Cl. 455-62.000.
Roland, Anthony M. Multiple sound picture projection cinema. 4,555,167, Cl. 352-133.000.
Roman, Charles A.: *See—*
Orsak, John E.; and Roman, Charles A., 4,555,438, Cl. 428-219.000.
Roos, Otto: *See—*
Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, 4,555,511, Cl. 514-301.000.
Roschmann, Peter, to U.S. Philips Corporation. Method of manufacturing a disc resonator. 4,555,374, Cl. 264-40.100.
Rosen, Meyer R.; Fan, You-Ling; and Chu, Nan S., to Union Carbide Corporation. Process for flocculating phophatic slimes. 4,555,346, Cl. 210-734.000.
Rossi, Barbara A.: *See—*
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Rossler, Sonja: *See—*
Ploch, Siegfrid; Rossler, Sonja; Zeisberg, Peter; and Heilmann, Horst, 4,554,804, Cl. 66-214.000.
Roth, Siegfried; and Stenzenberger, Horst, to Dornier GmbH; and Technochemie GmbH-Verfahrenstechnik. Preformed, laminated plastic panels. 4,555,426, Cl. 428-113.000.
Rothenberg, Irwin P., to Stik-Trim Industries, Incorporated. Self-adhesive wall covering or the like and method of making same. 4,555,441, Cl. 428-284.000.
Rovnyak, George C., to E. R. Squibb & Sons, Inc. Dioxolenylmethyl ester prodrugs of phosphinic acid ace inhibitors. 4,555,579, Cl. 548-409.000.
Rowland, W. Ross. Vehicular road block. 4,554,695, Cl. 14-69.500.
Rowland, William P., to Reflexite Corporation. Encapsulated retroreflective material and method of making same. 4,555,161, Cl. 350-103.000.
RTE Corporation: *See—*
DuPont, John P., 4,555,588, Cl. 174-73.00R.
Rudd, Michael J., to United States of America, Navy. Laser vibrometer. 4,554,836, Cl. 73-657.000.
Rudnev, Evgeny A.: *See—*
Vasiliev, Leonard L.; Kiselev, Vladimir G.; Morgun, Valery A.; Marchenko, Anatoly M.; Rudnev, Evgeny A.; Nesvit, Vasily A.; Dunaevsky, Leonid M.; Tverdokhleb, Nikolai F.; Bogdanov, Vladimir M.; and Rabetsky, Mikhail I., 4,554,966, Cl. 165-104.210.
Ruenzi, Kurt. Apparatus for collating sheets of paper. 4,555,106, Cl. 271-297.000.
Rufer, Clemens; and Boettcher, Irmgard, to Schering Aktiengesellschaft. Indanyl derivatives, their preparation and use. 4,555,406, Cl. 514-605.000.
Ruhrkohle Aktiengesellschaft: *See—*
Wolowski, Eckard; and Mirtsch, Frank, 4,555,325, Cl. 208-10.000.
Rupert, John P.: *See—*
Patton, John T., Jr.; and Rupert, John P., 4,555,530, Cl. 521-131.000.
Rupprechter, Helmut: *See—*
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Rusch, Dieter: *See—*
Behrens, Gunter; Schmitz, Walter; Kitzer, Peter; and Rusch, Dieter, 4,555,585, Cl. 136-245.000.
RY AB, Fack: *See—*
Smedberg, Olof R., 4,554,959, Cl. 144-380.000.
Ryan, David. Generator and rechargeable battery system for pedal powered vehicles. 4,555,656, Cl. 320-5.000.
Ryuno, Koitchiro: *See—*
Yamada, Hideaki; and Ryuno, Koitchiro, 4,555,487, Cl. 435-253.000.
Sabacky, Bruce J.; and Hepworth, Malcolm T., to Amax Inc. Flash roasting of molybdenum sulfide concentrates in a slagging reactor. 4,555,387, Cl. 423-59.000.
Sack, Michael C.; Henson, Donald E.; and Sack, Russell M., to Sack, Michael C. Shelf assembly and a support bracket for use therein. 4,555,082, Cl. 248-220.100.
Sack, Russell M.: *See—*
Sack, Michael C.; Henson, Donald E.; and Sack, Russell M., 4,555,082, Cl. 248-220.100.
Sadek, Kadry: *See—*
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Sadlo, James L.; and Musil, Gary D., to General Electric Company. High reliability electrical components. 4,554,732, Cl. 29-620.000.
Sage, Jay P., to United States of America, Air Force. Charge-coupled device Gaussian convolution method. 4,555,770, Cl. 364-819.000.
Saint-Gobain Vitrage: *See—*
Kunert, Heinz, 4,555,434, Cl. 428-194.000.
Saito, Gunji: *See—*
Umeno, Hiroshi; Saito, Gunji; and Hayashida, Morimasa, 4,554,780, Cl. 56-11.800.
Saito, Hiroshi: *See—*
Asano, Juichi; Okubo, Yasuo; Saito, Hiroshi; and Harada, Shigeru, 4,555,064, Cl. 241-89.300.
Orikasa, Wataru; Tochimoto, Kunio; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; and Saito, Hiroshi, 4,555,286, Cl. 156-94.000.
Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.
Saito, Kazumasa: *See—*
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Saitoh, Keishi: *See—*
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,555,465, Cl. 430-95.000.
Sakaguchi, Yukihiko; Sato, Kozo; Naito, Hideki; and Hara, Hiroshi, to Fuji Photo Film Co., Ltd. Heat-developable color photographic material with heat fusible compound. 4,555,470, Cl. 430-203.000.

Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, to Fuji Photo Film Co., Ltd. Heat development process with stabilizer. 4,555,476, Cl. 430-351.000.
Sakai, Nobuo; Okazaki, Masaki; and Inagaki, Yoshio, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,555,479, Cl. 430-372.000.
Sakakibara, Shinsuke: *See*—
Inaba, Hajimu; and Sakakibara, Shinsuke, 4,555,758, Cl. 364-174.000.
Sakakibara, Takao: *See*—
Kokubu, Sadao; Hirano, Masatoshi; and Sakakibara, Takao, 4,555,743, Cl. 361-196.000.
Sakoe, Hiroaki, to Nippon Electric Co., Ltd. DP Matching system for recognizing a string of words connected according to a regular grammar. 4,555,796, Cl. 381-43.000.
Sakuragi, Toshio; Nakayama, Kazuo; Sato, Masaaki; and Koike, Mitsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Automatic flaw detection device. 4,554,835, Cl. 73-640.000.
Sakurai, Takayasu, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 4,555,778, Cl. 365-230.000.
Sakuta, Daniel, Jr. Trolling bucket. 4,554,757, Cl. 43-55.000.
Salamone, Ann B.: *See*—
Hoover, Merwin F.; Salamone, Ann B.; and Vandebult, Jan, 4,555,414, Cl. 427-43.100.
Saliger, Kenneth C., to Mobil Oil Corporation. Seal construction for fluid swivel joints. 4,555,118, Cl. 277-188.00R.
Salter, Robert S.: *See*—
Buckley, Leo P.; Burrill, Kenneth A.; Desjardins, Conrad D.; and Salter, Robert S., 4,555,361, Cl. 252-626.000.
Salvarezza, Robert M. Rope ladder with molded hard elastomer steps and replacement steps and collars therefor. 4,554,996, Cl. 182-199.000.
Salzle, Erich. Method of polishing glass articles in an acid bath. 4,555,304, Cl. 156-663.000.
Sampogna, Michael: *See*—
Chance, Dudley A.; Reiley, Timothy C.; and Sampogna, Michael, 4,555,285, Cl. 156-89.000.
Samson, Wilfred J.; and Solar, Ronald J., to Advanced Cardiovascular Systems, Inc. Catheter guide wire with short spring tip and method of using the same. 4,554,929, Cl. 128-772.000.
Sancini, Aldo; and Stacher, Miguel A., to Aktiengesellschaft Adolph Saurer. Weaving machine, especially a terry cloth weaving machine. 4,554,950, Cl. 139-25.000.
Sandberg, Jan-Erik: *See*—
Johansson, Borje; Pramskog, Torbjorn; and Sandberg, Jan-Erik, 4,554,860, Cl. 89-1.700.
Sander, Rembrandt, to Gebr. Hofmann GmbH & Co. KG Maschinenfabrik. Apparatus for automatic insertion of balance weights for use in automobile-wheel balancing equipment. 4,554,734, Cl. 29-818.000.
Sanders Associates, Inc.: *See*—
Bryant, William E., 4,555,807, Cl. 455-137.000.
Sanders, Georgius B. J.: *See*—
Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; Sanders, Georgius B. J.; and van Nieuwland, Jacob M., 4,555,797, Cl. 381-117.000.
Sands, Howard E., to Coleco Industries, Inc. Multicolored unitary thermoformed article. 4,555,423, Cl. 428-79.000.
Sandstrom, Robert L.: *See*—
Sirovich, Bruce E.; Sandstrom, Robert L.; and Fleisch, Theo H., 4,555,395, Cl. 423-644.000.
Sanji, Koichiro: *See*—
Sugimori, Masaru; and Sanji, Koichiro, 4,555,561, Cl. 528-26.000.
Sankyo Yuki Kabushiki Kaisha: *See*—
Yoshida, Tadayuki, 4,555,345, Cl. 210-705.000.
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Sanshin Kogyo Kabushiki Kaisha: *See*—
Sougawa, Masafumi, 4,554,896, Cl. 123-179.00G.
Sant-Andrea Novara Officine Meccaniche e Fonderie S.p.A.: *See*—
Bianchi, Angelo, 4,554,709, Cl. 19-218.000.
Santana, Manuel R.: *See*—
Gardner, William B.; Patel, Parbhubhai D.; Philen, Dan L.; and Santana, Manuel R., 4,555,175, Cl. 356-32.000.
Santrade Limited: *See*—
Backlund, Lars K., 4,554,985, Cl. 175-371.000.
Sanyo Electric Co., Ltd.: *See*—
Fujimoto, Isao, 4,555,808, Cl. 455-180.000.
Sarma, Kalluri R.: *See*—
Legge, Ronald; Rice, M. John, Jr.; and Sarma, Kalluri R., 4,555,303, Cl. 156-643.000.
Saruyama, Toshio; and Mikami, Ryuzo, to Toray Silicone Company, Ltd. Room temperature vulcanizable polyorganosiloxane compositions containing ketoximosilanes and organotitanates. 4,555,560, Cl. 528-17.000.
Sato, Kazuyoshi: *See*—
Maeda, Yoshiyasu; Ueura, Akira; Sato, Kazuyoshi; and Watanabe, Katsunori, 4,555,069, Cl. 242-43.00R.
Sato, Kozo: *See*—
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Sato, Masaaki: *See*—
Sakuragi, Toshio; Nakayama, Kazuo; Sato, Masaaki; and Koike, Mitsuhiro, 4,554,835, Cl. 73-640.000.
Sato, Taketoshi: *See*—
Mizukawa, Takumi; Ogino, Yoshio; Ohmori, Hideki; and Sato, Taketoshi, 4,555,608, Cl. 219-10.770.
Sato, Tsutomu, to Ricoh Company, Ltd. Deflection control ink jet operation adjustment control. 4,555,711, Cl. 346-75.000.
Satoh, Tamataro: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,554,897, Cl. 123-188.0AA.
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,554,898, Cl. 123-188.0AA.
Satoturve Oy: *See*—
Jamsa, Hannu, 4,554,750, Cl. 37-3.000.
Saudagar, Abdul S. Urinary drainage appliance. 4,555,242, Cl. 604-96.000.
Sauer, John E.: *See*—
Krambeck, Frederick J.; McGovern, Stephen J.; and Sauer, John E., 4,555,328, Cl. 208-157.000.
Sauer, Robert L.; Morrissette, Charles G.; Garbaczik, Stanley J., Sr.; and Garbaczik, Stanley J., Jr., to Food Equipment Manufacturing Corporation. Cutting machine for slicing circular articles into wedges. 4,554,852, Cl. 83-407.000.
Sauer, Rudolf: *See*—
Knapp, Heinrich; Sauer, Rudolf; Krauss, Rudolf; and Hafner, Udo, 4,555,060, Cl. 239-585.000.
Sawai, Shinichi: *See*—
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Sawatari, Norio: *See*—
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Schaff, Didier: *See*—
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Schepers, Eberhard: *See*—
Jablonka, Dieter; Urban, Klaus; Raidt, Heinz-Peter; and Schepers, Eberhard, 4,555,433, Cl. 428-166.000.
Scherer, Michael: *See*—
Simon, Fritz; Korber, Klaus; Bandelow, Horst; Scherer, Michael; Wilke, Dieter; Thron, Werner; and Preuk, Gerhard, 4,554,707, Cl. 17-47.000.
Schering Aktiengesellschaft: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,555,507, Cl. 514-172.000.
Rufer, Clemens; and Boettcher, Irmgard, 4,555,406, Cl. 514-605.000.
Schetina, Otto: *See*—
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Schiefer, Bernhard; and Bumberger, Herbert, to Didier-Werke AG; and Voest-Alpine AG. Closure mechanism with gas seal. 4,555,050, Cl. 222-597.000.
Schiel, Christian: *See*—
Steiner, Karl; Schiel, Christian; Meinecke, Albrecht; Mullner, Josef; and Weiss, Hans, 4,555,305, Cl. 162-205.000.
Schirrmacher, Roland: *See*—
Maier, Peter; Schirrmacher, Roland; and Simen, Rolf, 4,555,199, Cl. 403-370.000.
Schlack, Ronald A. Arrangement for providing heat to a personnel bucket of an aerial lift vehicle. 4,554,995, Cl. 182-129.000.
Schlegel Corporation: *See*—
Clouthier, Richard S.; and Rogers, Thomas A., 4,555,171, Cl. 355-3.0CH.
Schleicher, Ulrich, to Diehl, GmbH & Co. Arrangement for reducing the base drag in projectiles. 4,554,872, Cl. 102-490.000.
Schlumberger Technology Corporation: *See*—
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Schmidt, Charles J., to Temple, Arthur, III, a part interest. Apparatus for rounding the circumference of a log. 4,554,958, Cl. 144-4.000.
Schmidt, Robert H.: *See*—
Polad, Michael D.; Gerlach, LeRoy E.; and Schmidt, Robert H., 4,555,610, Cl. 219-121.0LA.
Schmidt, Stephen C.: *See*—
Moore, David S.; and Schmidt, Stephen C., 4,555,176, Cl. 356-301.000.
Schmidt, Timothy J.; and Heintzleman, Ronald A., to General Safety Corporation. Dual mode seat belt retractor assembly. 4,555,075, Cl. 242-107.40A.
Schmitt, Dallas L.; and Spencer, Kenneth E., to Lukens General Industries, Inc. Pedestal tie bar arrangement. 4,554,875, Cl. 105-221.00R.
Schmitt, Joseph M., to American Cyanamid Company. Purification of acrylonitrile. 4,555,367, Cl. 260-465.900.
Schmitt, Kirk D., to Mobil Oil Corporation. Method for determining flow patterns in subterranean petroleum and mineral containing formations using organonitrogen tracers. 4,555,488, Cl. 436-27.000.
Schmitt, Kirk D., to Mobil Oil Corporation. Method for determining flow patterns in subterranean petroleum and mineral containing formations using organosulfur tracers. 4,555,489, Cl. 436-27.000.
Schmitz, Reinold: *See*—
Schutze, Detlef-Ingo; Schmitz, Reinold; and Wunderlich, Klaus, 4,555,580, Cl. 549-52.000.
Schmitz, Walter: *See*—
Behrens, Gunter; Schmitz, Walter; Kitzer, Peter; and Rusch, Dieter, 4,555,585, Cl. 136-245.000.

Schmodde, Hermann; and Haltenhof, Hans-Gunter, to H. Stoll GmbH & Co. Flat-bed knitting machine having electro-mechanical selection. 4,554,803, Cl. 66-75.200.

Schneider, David E., to Great Bend Manufacturing Co., Inc. Quick attach tractor mounting assembly for agricultural dozer and loader implement. 4,554,978, Cl. 172-247.000.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Lee, Seok H.; and Phelps, Mary E., 4,555,364, Cl. 260-397.200.

Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, to Boehringer Ingelheim KG. Thieno [3,2,C]pyridines useful as antihypertensives. 4,555,511, Cl. 514-301.000.

Schramm, Matthias: *See*—
Goldmann, Siegfried; Bossert, Friedrich; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,555,512, Cl. 514-302.000.

Schutze, Detlef-Ingo; Schmitz, Reinold; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of thioindigo compounds. 4,555,580, Cl. 549-52.000.

Schwarting, Karl-Heinz: *See*—
Holz, Joachim; Meier, Wolfgang; Schwarting, Karl-Heinz; Goris, Heinrich; and Ogorek, Kurt, 4,555,142, Cl. 299-43.000.

Schwenzer, Alfred F.: *See*—
Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., 4,555,299, Cl. 156-552.000.

Scifres, Donald R.; Streifer, William; and Burnham, Robert D., to Xerox Corporation. Optical repeater integrated lasers. 4,555,785, Cl. 372-8.000.

Scott & Fetzer Company, The: *See*—
Kochte, Werner W.; and Nimon, Susan K., 4,554,702, Cl. 15-372.000.

Scott Orthopedics, Inc.: *See*—
Womack, Darryl L.; Noell, Ralph B.; and Bradshaw, Larry R., 4,554,913, Cl. 128-80.00C.

Scribner, Kenneth J., to United States of America, Energy. Extrusion cast explosive. 4,555,277, Cl. 149-19.400.

Scruggs, David M., to Dresser Industries, Inc. Amorphous alloy plain bearings. 4,555,186, Cl. 384-93.000.

Sealey, Graham P.; and Corney, Andrew C., to Tru Test Distributors Limited. Arrangement and method for liquid level measurement. 4,554,831, Cl. 73-304.00R.

Segal, Brahm R. High-fidelity audio frequency amplifier. 4,555,672, Cl. 330-255.000.

Segler, Calvin A. Strength saver commode. 4,554,689, Cl. 4-254.000.

Seiferth, Oscar E.: *See*—
Brown, Richard K.; and Seiferth, Oscar E., 4,555,605, Cl. 219-10.55E.

Seisan Nippon Sha, Ltd.: *See*—
Yano, Mitsuru, 4,555,282, Cl. 156-66.000.

Seki, Masaki: *See*—
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,555,590, Cl. 178-18.000.

Sekiguchi, Nobuhisa: *See*—
Yokoyama, Shigeki; Nakamura, Koki; Kouda, Jyounichi; and Sekiguchi, Nobuhisa, 4,555,480, Cl. 430-527.000.

Seko, Yasutoshi: *See*—
Yanagishima, Takayuki; and Seko, Yasutoshi, 4,555,694, Cl. 340-524.000.

Sell, James. Sewer outlet connecting and capping arrangement. 4,554,949, Cl. 137-899.000.

Semon, Joseph R., to Casket Shells, Inc. Casket sealing gasket. 4,555,119, Cl. 277-207.00R.

Sendelbach, Lee A.: *See*—
Dahl, Richard E.; Faflak, Daniel P.; and Sendelbach, Lee A., 4,555,701, Cl. 340-736.000.

Sendo, Takashi: *See*—
Asaoka, Sachio; and Sendo, Takashi, 4,555,394, Cl. 423-626.000.

Senzaki, Takaya: *See*—
Hosaka, Takefumi; Imai, Takeshi; and Senzaki, Takaya, 4,555,691, Cl. 340-52.00R.

Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Houston, Timothy L., to ICI Australia Limited. Herbicidal cyclohexane-1,3-dione derivatives. 4,555,263, Cl. 71-98.000.

Sergovic, John A.; and McClinton, John L., to Burns & Russell Company. Method and apparatus for in mold coating. 4,555,375, Cl. 264-259.000.

Seshimoto, Osamu: *See*—
Kitajima, Masao; Seshimoto, Osamu; and Mizutani, Shigemitsu, 4,555,274, Cl. 148-6.14R.

Sevaille, Jean-Claude: *See*—
Bonnet, Bernard; Bressy, Roger; and Sevaille, Jean-Claude, 4,555,640, Cl. 307-115.000.

Seyfried, Donald N.: *See*—
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,554,814, Cl. 72-345.000.

SGS-ATES Componenti Elettronici S.p.A.: *See*—
Palara, Sergio; and Torazzina, Aldo, 4,555,674, Cl. 330-267.000.

SGS-ATES Componenti Elettronici SpA: *See*—
Devecchi, Daniele; and Torelli, Guido, 4,555,644, Cl. 307-482.000.

Shah, Jayantkumar R.: *See*—
Brightman, Barrie; Elliott, George; Lenk, Pedro A.; Shah, Jayantkumar R.; and Stewart, William H., 4,555,595, Cl. 179-18.0ES.

Shanley, Robert L., II: *See*—
Harwood, Leopold A.; and Shanley, Robert L., II, 4,555,722, Cl. 358-17.000.

Sharma, Gulab, to Beehive International. Cathode ray tube focusing circuitry. 4,555,649, Cl. 315-382.000.

Sharp, David G.: *See*—
Moran, David P. J.; Hepburn, John J.; and Sharp, David G., 4,555,411, Cl. 426-603.000.

Sharp Kabushiki Kaisha: *See*—
Aiba, Masahiko; Kuranishi, Masaaki; and Miyake, Hideyuki, 4,555,718, Cl. 346-140.00R.
Taguchi, Toshimichi, 4,555,601, Cl. 200-5.00A.

Shaub, Melvin H.: *See*—
Ollinger, James C.; and Shaub, Melvin H., 4,554,718, Cl. 29-155.00R.

Sheets, Ronald E.; Barbas, George A.; Doering, Howard W., Jr.; and Bjorkman, John R., to Tamarack Scientific Co., Inc. Automatic system for exposing and handling double-sided printed circuit boards. 4,555,630, Cl. 250-492.100.

Shell Oil Company: *See*—
Devlin, Barry R. J., 4,555,260, Cl. 71-88.000.

Shepard, Joseph F., to International Business Machines Corporation. Simplified planarization process for polysilicon filled trenches. 4,554,728, Cl. 29-576.00W.

Shey, Por-Jiy. Emergency descent device. 4,554,997, Cl. 182-238.000.

Shiba, Keisuke; Fuchizawa, Tetsuro; Nakao, Sho; and Ohishi, Chikashi, to Fuji Photo Film Co., Ltd. Process for preparing a lithographic printing plate. 4,555,461, Cl. 430-49.000.

Shibata, Komei: *See*—
Shimazaki, Fumio; Asai, Koji; and Ohno, Jiro, 4,555,113, Cl. 273-80.00B.

Shibuya Kogyo Co., Ltd.: *See*—
Miyashita, Yoshikazu; Muranaka, Shiaru; and Tanaka, Hideo, 4,554,774, Cl. 53-52.000.

Shigetomi, Masayoshi: *See*—
Orikasa, Wataru; Tochimoto, Kunio; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; and Saito, Hiroshi, 4,555,286, Cl. 156-94.000.
Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.

Shiibayashi, Masao: *See*—
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, 4,555,224, Cl. 418-55.000.

Shiinoki, Kunikatsu: *See*—
Takano, Hiroshi; and Shiinoki, Kunikatsu, 4,555,241, Cl. 474-261.000.

Shimamura, Takeo: *See*—
Kurosawa, Ryoichi; and Shimamura, Takeo, 4,555,755, Cl. 363-160.000.

Shimano Industrial Company Limited: *See*—
Hitomi, Yasuhiro, 4,555,072, Cl. 242-84.50R.

Shimazaki, Fumio; Asai, Koji; and Ohno, Jiro, to Shibata, Komei. Shaft and a method for producing the same. 4,555,113, Cl. 273-80.00B.

Shimizu, Masao, to Takeda Riken Co., Ltd. Test pattern generating apparatus. 4,555,663, Cl. 324-73.00R.

Shimoni, Yair: *See*—
Fenster, Paul; Netter, Zvi; and Shimoni, Yair, 4,555,728, Cl. 358-111.000.

Shimoyama, Yoshiaki: *See*—
Takeshita, Takeaki; Oba, Katuyuki; Shimoyama, Yoshiaki; and Masuda, Takashi, 4,555,264, Cl. 75-49.000.

Shino, Shigenari: *See*—
Hiroyasu, Minoru; Yamashita, Hideo; Ohguro, Tamotsu; Yamagishi, Shigeru; and Shino, Shigenari, 4,555,205, Cl. 408-150.000.

Shiojiri Kogyo Kabushiki Kaisha: *See*—
Fujimori, Motoyuki, 4,555,184, Cl. 368-88.000.

Shionogi & Co., Ltd.: *See*—
Nagata, Wataru; and Aoki, Tsutomu, 4,555,578, Cl. 548-251.000.

Shirahata, Kunikatsu: *See*—
Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, 4,555,402, Cl. 424-122.000.

Shirai, Shigeru: *See*—
Ogawa, Kyosuke; Shirai, Shigeru; Saitoh, Keishi; Misumi, Teruo; and Kanbe, Junichiro, 4,555,465, Cl. 430-95.000.

Shirasaka, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic pulse Doppler blood flow meter with provision to create ultrasonic test waves which, when reflected from a stationary object, result in echoes similar to those produced by a moving object. 4,554,926, Cl. 128-663.000.

Shirogami, Tamotsu: *See*—
Ueno, Mitsushi; Shirogami, Tamotsu; and Mikogami, Yukihiro, 4,555,324, Cl. 204-284.000.

Sho-Bond Construction Co., Ltd.: *See*—
Orikasa, Wataru; Tochimoto, Kunio; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; and Saito, Hiroshi, 4,555,286, Cl. 156-94.000.
Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.

Shonrock, Clinton O.; and Wambaugh, John O., to Schlumberger Technology Corporation. Apparatus for sealing a well casing. 4,554,973, Cl. 166-192.000.

Showa Denko Kabushiki Kaisha: *See*—
Horie, Shin'ichi; Matsuzaki, Yutaka; and Kagawa, Fumio, 4,555,250, Cl. 51-309.000.

Showers, Towanda S.: *See*—
Eagon, Vicki L.; and Showers, Towanda S., 4,555,022, Cl. 206-440.000.
Shtarkman, Emile M., to Imperial Clevite Inc. Self-stabilizing dry viscous spring damper. 4,555,098, Cl. 267-140.100.
Shu, Peter H., to General Electric Company. Compositions of polyphenylene ether resin and high impact polystyrene resin having improved ultraviolet light resistance. 4,555,538, Cl. 524-102.000.
Shulman, Burt H., to Unimation, Inc. Image sensing and welding arrangement for manipulator welding apparatus. 4,555,613, Cl. 219-124.340.
Shung, Wu-shi: *See*—
Hwang, Eddie Y.; Szabo, Andras I.; and Shung, Wu-shi, 4,554,788, Cl. 60-646.000.
Shuster, Nicholas, to Gould, Inc. Reinforced consumable electrode, electrochemical cell and method. 4,555,454, Cl. 429-51.000.
Shuto, Katsuichi: *See*—
Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, 4,555,402, Cl. 424-122.000.
Siebenhofer, Gottfried: *See*—
Wrulich, Herwig; Schetina, Otto; Siebenhofer, Gottfried; and Maier, Wilfried, 4,555,143, Cl. 299-81.000.
Sieloff, Ronald F.; and Kaya, William A., to Owens-Corning Fiberglas Corporation. Blowing wool insulation. 4,555,447, Cl. 428-392.000.
Siemens Aktiengesellschaft: *See*—
Finkenzeller, Johann; and Hubert, Gunter, 4,555,794, Cl. 378-187.000.
Quella, Ferdinand; and Steinwender, Bernd, 4,555,284, Cl. 156-79.000.
von Winnicki, Kalixt, 4,555,660, Cl. 323-224.000.
Signetics Corporation: *See*—
Huijsing, Johan H.; and van de Plassche, Rudy J., 4,555,673, Cl. 330-258.000.
Simen, Rolf: *See*—
Maier, Peter; Schirrmacher, Roland; and Simen, Rolf, 4,555,199, Cl. 403-370.000.
Simmons, Ralph F.: *See*—
Jackson, Bruce J.; Simmons, Ralph F.; and Covault, Mike L., 4,555,740, Cl. 360-113.000.
Simmons, Stanley J. Flexible brush. 4,554,699, Cl. 15-201.000.
Simon, Clarence E.: *See*—
Anderson, Clifford E.; Simon, Clarence E.; and Barnes, Phillip E., 4,555,084, Cl. 248-460.000.
Simon, Fritz; Korber, Klaus; Bandelow, Horst; Scherer, Michael; Wilke, Dieter; Thron, Werner; and Preuk, Gerhard, to VE Fleischkombinat Berlin. Method of treating pigskin. 4,554,707, Cl. 17-47.000.
Simon, Ulrich: *See*—
Erdmann, Fritz; and Simon, Ulrich, 4,555,469, Cl. 430-168.000.
Simond, Jacques A. L.: *See*—
Combourieu, Michel; Simond, Jacques A. L.; and Monteil, Andre J., 4,555,514, Cl. 514-343.000.
Simpson, Thomas K.: *See*—
von Lersner, Wolf A.; Cheeseman, Edward W.; Simpson, Thomas K.; and Weaver, George R., 4,554,955, Cl. 141-1.000.
Sinclair Research Limited: *See*—
Beesley, Graham E., 4,555,677, Cl. 330-302.000.
Singer Company, The: *See*—
Laidig, Manfred R., 4,554,878, Cl. 112-235.000.
Sirac SpA: *See*—
Carobbi, Renato; Miletti, Sandro; and Franci, Vittorio, 4,555,271, Cl. 127-46.200.
Sirovich, Bruce E.; Sandstrom, Robert L.; and Fleisch, Theo H., to Standard Oil Company. Hydride compositions. 4,555,395, Cl. 423-644.000.
SKF (U.K.) Limited: *See*—
Neal, Hubert W. T., 4,555,188, Cl. 384-482.000.
Skolaude, Werner; and Eggendorfer, Gunnar, to Linde Aktiengesellschaft. Process and device for the production of gaseous oxygen at elevated pressure. 4,555,256, Cl. 62-18.000.
Slack, Douglas J., to Texas Instruments Incorporated. Motor starting device. 4,555,684, Cl. 335-66.000.
Smart, Colin: *See*—
Clarke, David E.; Davies, James F.; Smart, Colin; and Tune, John B., 4,555,354, Cl. 252-90.000.
Smedberg, Olof R., to RY AB, Fack; and AB Wilh. Becker, Fack. Surface treatment of sheet material. 4,554,959, Cl. 144-380.000.
Smith, David E.: *See*—
Distin, Robert G., Jr.; Lang, Thomas J.; and Smith, David E., 4,554,846, Cl. 74-805.000.
Smith, Donald R.: *See*—
Geurtsen, Friedrich H. H.; Anemaet, John M.; Smith, Donald R.; and Boyd, Mary G., 4,555,436, Cl. 428-200.000.
Smith, Ira A., Jr.: *See*—
Rodth, Joseph J.; Smith, Ira A., Jr.; and Cornett, Donald F., 4,555,045, Cl. 222-1.000.
Smith, Robert R.: *See*—
Kapp, John P.; and Smith, Robert R., 4,554,914, Cl. 128-92.00C.
Smith, Terry W.; and Fallon, Timothy R., to Draft Systems, Inc. Food cooker. 4,554,864, Cl. 99-340.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; and Stodt, Rolf, 4,554,813, Cl. 72-251.000.
Smyly, Harold M.; Miller, Charles D.; Cloyd, Richard A.; and Heller, Clarence, to United States of America, National Aeronautics and Space Administration. Space probe/satellite ejection apparatus for spacecraft. 4,554,905, Cl. 124-56.000.
Snider, Scott C.; and DeLeon, Alberto, to Celotex Corporation, The. Alkoxylated aromatic amine-aromatic polyester polyol blend and polyisocyanurate foam therefrom. 4,555,418, Cl. 427-373.000.
Snyder Laboratories, Inc.: *See*—
Atkinson, Robert W., 4,555,645, Cl. 310-27.000.
Socapex: *See*—
Bricaud, Herve ; and L'Henaff, Patrick, 4,555,153, Cl. 339-17.0CF.
Societe Belge d'Exploitation de la Navigation Aerienne (SABENA): *See*—
Grognard, Leon L., 4,555,078, Cl. 244-54.000.
Societe Chimique des Charbonnages CDF Chimie, S.A.: *See*—
Meyer, Nicolas; and Cousin, Michel, 4,555,544, Cl. 524-595.000.
Societe d'Applications Generales d'Electricite et de Mecaniques Sagem: *See*—
Vegeais, Patrick; Brot, Michel; and Valet, Jean-Yves, 4,555,715, Cl. 346-76.0PH.
Societe Nationale Elf Aquitaine: *See*—
Bauer, Denise; Komornicki, Jacques; and Tellier, Jacques, 4,555,343, Cl. 210-643.000.
Societe Parisienne d'Impression et de Cartonnage: *See*—
Chazal, Guy A.; and Bodet, Jean A., 4,555,381, Cl. 264-516.000.
Soda, Hiroshi: *See*—
Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.
Sohne oHG: *See*—
Bauer, Fritz; Bauer, Hans-Peter; and Bauer, Hans Jurgen, 4,555,085, Cl. 248-561.000.
Solar, Ronald J.: *See*—
Samson, Wilfred J.; and Solar, Ronald J., 4,554,929, Cl. 128-772.000.
Solund, Jorgen, to ITS-Intern Transport System A/S. Junction diverter for a transport system. 4,555,010, Cl. 198-361.000.
Solvay & Cie: *See*—
Nicolas, Edgard; and Merckaert, Louis, 4,555,317, Cl. 204-129.000.
Soneta, Eietsu; and Urata, Tetsukazu, to Toyo Sanso Co., Ltd. Method of and apparatus for burning exhaust gases containing gaseous silane. 4,555,389, Cl. 423-210.000.
Sonnenberg, Sven: *See*—
Hall, Richard W.; Sonnenberg, Sven; and Mahal, Harbhajan S., 4,555,220, Cl. 417-342.000.
Sorensen, Ian W.; and Kiwak, Robert S., to Bendix Corporation. Method for making carbon microfibers. 4,555,393, Cl. 423-447.100.
Sorger, Gunter U.; and Raicu, Dan, to Eaton Corporation. Magnetically tunable resonators and tunable devices such as filters and resonant circuits for oscillators using magnetically tuned resonators. 4,555,683, Cl. 333-202.000.
Sosta, Pierluigi: *See*—
Campello, Ugo; Racca, Enrico; Sosta, Pierluigi; and Baggiolini, Deris, 4,555,020, Cl. 206-235.000.
Sougawa, Masafumi, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Fuel control system for internal combustion engines. 4,554,896, Cl. 123-179.00G.
Spar Aerospace Limited: *See*—
Ferguson, Robert C., 4,555,207, Cl. 411-366.000.
Spector, Richard; and Maulding, Donald R., to American Cyanamid Company. Hetero nitrogen containing compounds and polymerms light stabilized with said compounds. 4,555,537, Cl. 524-97.000.
Spencer, Kenneth E.: *See*—
Schmitt, Dallas L.; and Spencer, Kenneth E., 4,554,875, Cl. 105-221.00R.
Spendel, Wolfgang U., to Procter & Gamble Company, The. Packaged detergent composition with instructions for use in a laundering process. 4,555,019, Cl. 206-223.000.
Sperry Corporation: *See*—
Linde, Gilbert W., 4,555,061, Cl. 239-675.000.
Spivack, John D.: *See*—
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., 4,555,541, Cl. 524-180.000.
Spradling, Gene V.; and Stanek, Terrence L., to Emerson Electric Co. Means for reversing operation of a motor. 4,555,654, Cl. 318-751.000.
Spurlin, Stanford R.; and Yeung, Edward S., to Iowa State University Research Foundation, Inc. Sulfide chemiluminescence detection. 4,555,491, Cl. 436-120.000.
Srajer, Reinhard, to Woodford Manufacturing Company. Dock seal with adjustable top seal. 4,554,768, Cl. 52-173.0DS.
Stacher, Miguel A.: *See*—
Sancini, Aldo; and Stacher, Miguel A., 4,554,950, Cl. 139-25.000.
Standard Microsystems Corporation: *See*—
Morales, Louis J., 4,555,642, Cl. 307-475.000.
Standard Oil Company: *See*—
Fields, Ellis K., 4,555,350, Cl. 252-8.55D.
Kalpakci, Bayram; and Chan, Keng S., 4,554,974, Cl. 166-273.000.
Sirovich, Bruce E.; Sandstrom, Robert L.; and Fleisch, Theo H., 4,555,395, Cl. 423-644.000.
Standard Telephones and Cables Public Limited Company: *See*—
Howard, Kenneth G.; and Little, Ian E., 4,555,257, Cl. 65-13.000.
Stanek, Terrence L.: *See*—
Spradling, Gene V.; and Stanek, Terrence L., 4,555,654, Cl. 318-751.000.
Stankard, James M., to White Consolidated Industries, Inc. Split system air conditioner. 4,554,796, Cl. 62-326.000.

Stanley, Mervin D.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; and Stanley, Mervin D., 4,554,944, Cl. 137-296.000.
Stanley, Roderic K.; Milewits, Marvin; Knauer, Robert C., Jr.; and Bradfield, James E., to PA Incorporated. Magnetic flux method for measuring tubular wall thickness. 4,555,665, Cl. 324-229.000.
Stauffer Chemical Co.: *See*—
Wong, Rayman Y., 4,555,515, Cl. 514-357.000.
Stebbins, Edwin E.: *See*—
Crooke, Arthur W.; and Stebbins, Edwin E., 4,555,765, Cl. 364-571.000.
Stedman Corporation: *See*—
Cole, Tyler L., 4,555,428, Cl. 428-102.000.
Steffen, David E., to DICKEY-john Corporation. High rate seed sensor. 4,555,624, Cl. 250-223.00R.
Steinberg, Meyer, to United States of America, Energy. Portland cement for SO_2 control in coal-fired power plants. 4,555,392, Cl. 423-244.000.
Steinbruegge, Kenneth B.: *See*—
Gottlieb, Milton; and Steinbruegge, Kenneth B., 4,555,160, Cl. 350-358.000.
Steiner, Karl; Schiel, Christian; Meinecke, Albrecht; Mullner, Josef; and Weiss, Hans, to J. M. Voith GmbH. Apparatus and method for cooling a belt pressing unit in a paper machine. 4,555,305, Cl. 162-205.000.
Steiner, Meinrad: *See*—
Ludwig, Peter; and Steiner, Meinrad, 4,554,988, Cl. 177-178.000.
Steinwender, Bernd: *See*—
Quella, Ferdinand; and Steinwender, Bernd, 4,555,284, Cl. 156-79.000.
Stender, Erich; and Fuesers, Wilhelm G., to Mannesmann Aktiengesellschaft A.G. Method for the manufacture of a pipe bend. 4,554,816, Cl. 72-368.000.
Stenzenberger, Horst: *See*—
Roth, Siegfried; and Stenzenberger, Horst, 4,555,426, Cl. 428-113.000.
Stepan, William E.: *See*—
Neese, Wayne E.; and Stepan, William E., 4,555,151, Cl. 339-17.0CF.
Stephens, Lawrence K., to International Business Machines Corp. Current cursor symbol demarkation. 4,555,772, Cl. 364-900.000.
Stewart-Warner Corporation: *See*—
Raffaeli, Lidio P., 4,554,704, Cl. 16-21.000.
Stewart, William H.: *See*—
Brightman, Barrie; Elliott, George; Lenk, Pedro A.; Shah, Jayantkumar R.; and Stewart, William H., 4,555,595, Cl. 179-18.0ES.
Stik-Trim Industries, Incorporated: *See*—
Rothenberg, Irwin P., 4,555,441, Cl. 428-284.000.
Stiller, Thomas M.: *See*—
Lewis, Henry G., Jr.; and Stiller, Thomas M., 4,555,768, Cl. 364-757.000.
Stilling, Johann. Sign with flexible face. 4,554,754, Cl. 40-603.000.
Stobb, Anton R., deceased (by Stobb, Walter J., executor), to Stobb, Inc. Method and apparatus for separating signatures from a stack. 4,555,101, Cl. 270-58.000.
Stobb, Inc.: *See*—
Stobb, Anton R., deceased, 4,555,101, Cl. 270-58.000.
Thumm, Klaus A., 4,554,867, Cl. 100-3.000.
Stobb, Walter J., executor: *See*—
Stobb, Anton R., deceased, 4,555,101, Cl. 270-58.000.
Stockner, Alan R.: *See*—
Gibson, Dennis H.; Stockner, Alan R.; and Waldman, Donald J., 4,554,901, Cl. 123-450.000.
Stodt, Rolf: *See*—
Feldmann, Hugo; Gipperich, Theodor; Kirchhoff, Hans; and Stodt, Rolf, 4,554,813, Cl. 72-251.000.
Stodulka, Jan: *See*—
Voss, Jurgen; Dombkowski, Otto; Kudlich, Walter; and Stodulka, Jan, 4,555,024, Cl. 206-454.000.
Stone, Alan M., to Ok Tedi Mining Limited. Elution process and apparatus and extraction of particulate material from a vessel. 4,555,385, Cl. 423-30.000.
Stone, Philip J. Keyboards including color coding and one handed operation. 4,555,193, Cl. 400-486.000.
Stopke, J. Lawrence: *See*—
Gruich, Peter; and Stopke, J. Lawrence, 4,554,989, Cl. 180-65.400.
Storck, Robert C.: *See*—
Foley, Robert W.; Storck, Robert C.; Mickus, Donald J., deceased; and Pastors, Debbie, executrix, 4,554,979, Cl. 172-813.000.
Stout, David M.; Yamamoto, Diane M.; and Barcelon-Yang, Cynthia, to American Hospital Supply Corporation. Pyridone esters as inotropic agents. 4,555,517, Cl. 514-336.000.
Strapex AG: *See*—
Fischer, Charles, 4,554,779, Cl. 53-589.000.
Straubel, Max; and Zimmermann, Klaus-Dieter, to Robert Bosch GmbH. Fuel injection apparatus for injecting a fuel mixture comprising at least two components. 4,554,903, Cl. 123-575.000.
Streifer, William: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,555,785, Cl. 372-8.000.
Strepelis, John J.: *See*—
Berenato, Joseph W., III; Raivel, Earl L., Jr.; and Strepelis, John J., 4,555,209, Cl. 414-163.000.
Stromberg-Carlson Corp.: *See*—
Brightman, Barrie; Elliott, George; Lenk, Pedro A.; Shah, Jayantkumar R.; and Stewart, William H., 4,555,595, Cl. 179-18.0ES.
Strong, Douglas H.: *See*—
Frey, Gary T.; Strong, Douglas H.; and Urbanski, Janet B., 4,555,445, Cl. 428-340.000.
Suda, Yasuo; Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; and Ohtaka, Keiji, to Canon Kabushiki Kaisha. Focus detecting device for a camera. 4,555,169, Cl. 354-407.000.
Suematsu, Koushi: *See*—
Hasegawa, Tetsuo; and Suematsu, Koushi, 4,555,467, Cl. 430-110.000.
Sugars, John A., to International Telephone & Telegraph Corp. Electrical connector contact retention assembly. 4,555,154, Cl. 339-59.00R.
Sugimori, Masaru; and Sanji, Koichiro, to Sun Star Giken Kabushiki Kaisha. Polyurethane resin composition. 4,555,561, Cl. 528-26.000.
Suh, John T.; Regan, John R.; Piwinski, John J.; Menard, Paul; and Jones, Howard, to USV Pharmaceutical Corp. Antihypertensive spiro-cyclic compounds. 4,555,508, Cl. 514-211.000.
Sumal, Jaihind S., to Robert Bosch GmbH. Device for measuring the mass of a flowing medium. 4,554,829, Cl. 73-204.000.
Sumida, Atsushi; and Watanabe, Shizuo, to Toray Industries, Incorporated. Carbon fiber and process for preparing same. 4,555,446, Cl. 428-367.000.
Sumitomo Electric Industries, Ltd.: *See*—
Kodama, Hiroaki; Kubo, Tetsuo; and Miwa, Sinkichi, 4,555,799, Cl. 382-8.000.
Sumitomo Heavy Industries, Ltd.: *See*—
Nishiike, Naritoshi; Nishimaki, Takashi; Miura, Yasushi; and Kumamura, Masaaki, 4,555,228, Cl. 425-185.000.
Sun Star Giken Kabushiki Kaisha: *See*—
Sugimori, Masaru; and Sanji, Koichiro, 4,555,561, Cl. 528-26.000.
Sunagawa, Hiroshi: *See*—
Kido, Keishiro; Sunagawa, Hiroshi; Kawajiri, Kazuhiro; Iijima, Toshio; and Nozaki, Nobuharu, 4,555,464, Cl. 430-67.000.
Suriano, Francis J.: *See*—
Klaass, Reinhard M.; and Suriano, Francis J., 4,555,187, Cl. 384-103.000.
Suzuki, Arata, to Capintec Inc. Radiation shield in light detector and/or assembly. 4,555,626, Cl. 250-239.000.
Suzuki, Hajime: *See*—
Arita, Koichiro; and Suzuki, Hajime, 4,555,566, Cl. 528-323.000.
Suzuki, Kunio: *See*—
Kausga, Takuzo; Ikenaga, Yukio; and Suzuki, Kunio, 4,555,357, Cl. 252-511.000.
Suzuki, Yoshikuni: *See*—
Tahara, Yoshiyuki; Takahashi, Toshihiro; Koyama, Hiroyasu; Suzuki, Yoshikuni; and Yasuda, Masatoshi, 4,555,365, Cl. 260-404.000.
Swanson, Mark, to GenRad, Inc. Method of computerized in-circuit testing of electrical components and the like with automatic spurious signal suppression. 4,555,783, Cl. 371-15.000.
Sweeney, Theodore J., to Theodore Sweeney & Co. Adhesively securable fastener. 4,555,206, Cl. 411-23.000.
Sybron Chemicals Inc.: *See*—
Moran, James C., 4,555,348, Cl. 252-1.000.
Sykes, Donald J.; and Gendron, Gary E., to Marpac Industries, Inc. Drum containers. 4,555,023, Cl. 206-446.000.
Sykes, Robert C.; Connelly, Lawrence J.; and Roe, William J., to Nalco Chemical Company. Selective flocculation of coal. 4,555,329, Cl. 209-5.000.
Syrinek, Allen R.: *See*—
Giddings, David M.; Ries, Donald G.; and Syrinek, Allen R., 4,555,558, Cl. 526-287.000.
Szabo, Andras I.: *See*—
Hwang, Eddie Y.; Szabo, Andras I.; and Shung, Wu-shi, 4,554,788, Cl. 60-646.000.
T & R Chemicals, Inc.: *See*—
Martin, Bernard K., 4,555,522, Cl. 514-449.000.
Tachikawa Spring Co. Ltd.: *See*—
Nemoto, Akira, 4,555,141, Cl. 297-452.000.
Tagnon, Luc, to Essilor International Cie Generale d'Optique. Laser ophthalmological surgical device. 4,554,917, Cl. 128-303.100.
Tago, Yoshiaki: *See*—
Odawara, Kazuharu; and Tago, Yoshiaki, 4,555,716, Cl. 346-137.000.
Taguchi, Toshimichi, to Sharp Kabushiki Kaisha. Membrane keyboard. 4,555,601, Cl. 200-5.00A.
Tahara, Yoshiyuki; Takahashi, Toshihiro; Koyama, Hiroyasu; Suzuki, Yoshikuni; and Yasuda, Masatoshi, to Nisshin Flour Milling Co., Ltd. Isoprenylic acid amide derivatives. 4,555,365, Cl. 260-404.000.
Tait, William C.; and Harklau, Lanny L., to Minnesota Mining and Manufacturing Company. Method of constructing an LC network. 4,555,291, Cl. 156-250.000.
Taiyo Yuden Co., Ltd.: *See*—
Matuki, Shouzo, 4,554,703, Cl. 15-424.000.
Takahashi, Makoto, to TDK Co., Ltd. Rectifier circuit with two rectifiers. 4,555,753, Cl. 363-126.000.
Takahashi, Shiro, to Nitto Kohki Co., Ltd. Drilling machine. 4,555,203, Cl. 408-119.000.
Takahashi, Toshihiro: *See*—
Tahara, Yoshiyuki; Takahashi, Toshihiro; Koyama, Hiroyasu; Suzuki, Yoshikuni; and Yasuda, Masatoshi, 4,555,365, Cl. 260-404.000.
Takahashi, Toshinori: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; Kiuchi, Tsutomu; and Kitamura, Hiroki, 4,555,714, Cl. 346-76.0PH.

Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; Kiuchi, Tsutomu; and Kitamura, Hiroki, to Victor Company of Japan, Ltd. Apparatus and method for thermal ink transfer printing. 4,555,714, Cl. 346-76.0PH.
Takano, Hiroshi; and Shiinoki, Kunikatsu, to Mitsuboshi Belting, Ltd. Reinforced drive belt structure. 4,555,241, Cl. 474-261.000.
Takaya, Matsuhiko: *See*—
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,555,801, Cl. 382-44.000.
Takeda Riken Co., Ltd.: *See*—
Shimizu, Masao, 4,555,663, Cl. 324-73.00R.
Takeda, Shigetomo: *See*—
Fujii, Tatsuo; and Takeda, Shigetomo, 4,555,021, Cl. 206-387.000.
Takei, Haruo: *See*—
Inoue, Noriyuki; Okazaki, Masaki; Yamamuro, Kiyohiko; and Takei, Haruo, 4,555,482, Cl. 430-574.000.
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; and Toya, Ichizo, 4,555,481, Cl. 430-550.000.
Takeshita, Takeaki; Oba, Katuyuki; Shimoyama, Yoshiaki; and Masuda, Takashi, to Nippon Steel Corporation. Process for producing steel for an electrical steel sheet. 4,555,264, Cl. 75-49.000.
Takeuchi, Chikao: *See*—
Gounji, Takashi; Kawatsu, Teruo; Kasai, Yoshihiko; and Takeuchi, Chikao, 4,555,682, Cl. 333-189.000.
Takeuchi, Hiroo; and Miyazaki, Kazuo, to Nissin Kogyo Kabushiki Kaisha; and Honda Giken Kogyo Kabushiki Kaisha. Vacuum source device for vacuum booster for vehicles. 4,554,786, Cl. 60-397.000.
Takeya, Yasuo: *See*—
Hirooka, Hiroshi; Yoshida, Yoshio; Fukushi, Toshio; Takeya, Yasuo; and Nagai, Satoshi, 4,554,805, Cl. 68-12.00R.
Takoushian, John. Portable canine commode. 4,555,132, Cl. 294-1.500.
Talbot, Robert D., to Harris Corporation. Secure mobile telephone system. 4,555,805, Cl. 455-26.000.
Tamarack Scientific Co., Inc.: *See*—
Sheets, Ronald E.; Barbas, George A.; Doering, Howard W., Jr.; and Bjorkman, John R., 4,555,630, Cl. 250-492.100.
Tamfelt Oy Ab: *See*—
Lundstrom, Kristian, 4,555,306, Cl. 162-205.000.
Tamura, Kaoru; and Yamada, Sadami, to Fuji Photo Film Co., Ltd. Daylight film loading method and apparatus. 4,555,213, Cl. 414-412.000.
Tamura, Kohki: *See*—
Kahara, Toshiki; Mori, Toshikatsu; Imahashi, Jinichi; Honji, Akio; and Tamura, Kohki, 4,555,452, Cl. 429-13.000.
Tamura, Tooru: *See*—
Mochizuki, Hideaki; and Tamura, Tooru, 4,555,746, Cl. 361-323.000.
Tamura, Yukio; and Kaminishi, Masashi, to Kabushiki Kaisha Komatsu Seisakusho. Track-type vehicle undercarriage. 4,555,146, Cl. 305-10.000.
Tanaka, Hideo: *See*—
Miyashita, Yoshikazu; Muranaka, Shiaru; and Tanaka, Hideo, 4,554,774, Cl. 53-52.000.
Tanaka, Hideshi: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; Kiuchi, Tsutomu; and Kitamura, Hiroki, 4,555,714, Cl. 346-76.0PH.
Tanaka, Isamu; Kikuchi, Hiroshi; Tomizawa, Akira; and Oka, Hitoshi, to Hitachi, Ltd. Epoxy resin composition. 4,555,532, Cl. 523-400.000.
Tanaka, Kunio: *See*—
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,555,590, Cl. 178-18.000.
Tanaka, Mitsuaki: *See*—
Asami, Kazuto; Baba, Takao; Nakamura, Minoru; and Tanaka, Mitsuaki, 4,554,775, Cl. 53-64.000.
Tanaka, Tadaaki: *See*—
Yamada, Yasuyuki; Tanaka, Tadaaki; Tukahara, Ryoichi; and Nishizawa, Tsutomu, 4,555,355, Cl. 252-299.100.
Tanaka, Takeshi: *See*—
Ishimitsu, Ikuo; Tokunaga, Toshimichi; Tanaka, Takeshi; and Anan, Yoshiaki, 4,555,126, Cl. 280-707.000.
Tanaka, Tatsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Charging-/discharging circuit. 4,555,655, Cl. 320-1.000.
Tanaka, Tatsuo, to Kabushiki Kaisha Toshiba. Differential amplifier. 4,555,670, Cl. 330-252.000.
Tanck, Elinor J., to Xidex Corporation. Transparent ink jet recording medium. 4,555,437, Cl. 428-212.000.
Taniguchi, Hiroshi: *See*—
Usuki, Hiroshi; and Taniguchi, Hiroshi, 4,555,735, Cl. 358-330.000.
Tanimoto, Yasufumi: *See*—
Nawata, Yoshiaki; and Tanimoto, Yasufumi, 4,555,653, Cl. 318-696.000.
Tanimura, Nobuyoshi; and Yasui, Tokumasa, to Hitachi, Ltd. Method of making semiconductor memory device. 4,554,729, Cl. 29-577.00C.
Tano, Eiichi: *See*—
Wakui, Yoshio; Negishi, Kiyoshi; and Tano, Eiichi, 4,555,170, Cl. 354-470.000.
Taprogge Gesellschaft mbH: *See*—
Bochinski, Rolf; Eimer, Klaus; Lange, Alois; and Nghiem, Xuan L., 4,554,965, Cl. 165-95.000.
Tarantino, Elia R. J.: *See*—
Hanlet, Jacques M.; and Tarantino, Elia R. J., 4,554,908, Cl. 126-443.000.
Taylor, Walt S.: *See*—
Rennecker, David B.; and Taylor, Walt S., 4,554,698, Cl. 15-339.000.
TDK Co., Ltd.: *See*—
Takahashi, Makoto, 4,555,753, Cl. 363-126.000.
TDK Corporation: *See*—
Fujii, Tatsuo; and Takeda, Shigetomo, 4,555,021, Cl. 206-387.000.
Technical Research Associates, Inc.: *See*—
Baker, Charles D., 4,554,686, Cl. 623-16.000.
Technochemie GmbH-Verfahrenstechnik: *See*—
Roth, Siegfried; and Stenzenberger, Horst, 4,555,426, Cl. 428-113.000.
Technoplast B.V.: *See*—
Bekkers, Henricus A. M.; and Reyenga, Tjerk, 4,555,036, Cl. 215-220.000.
Tedhams, Michael H.: *See*—
Overley, Ronald V.; Tedhams, Michael H.; and Atzbach, Carl L., 4,554,907, Cl. 126-191.000.
Teeter, Brent A., to United States of America, Navy. Video target track valid indicator. 4,555,726, Cl. 358-93.000.
Teleconferencing Systems International, Inc.: *See*—
Deinzer, Gerald J., 4,555,592, Cl. 179-2.00E.
Teledyne Industries, Inc.: *See*—
Johnson, Donald L.; and Lingenfelter, Lowell R., 4,555,152, Cl. 339-17.00L.
Johnson, Donald L.; and Kordis, Thomas F., 4,555,157, Cl. 339-75.0MP.
Tell, Joseph M., to Carpenter Paper Company. Pollinating bag. 4,554,761, Cl. 47-1.410.
Tellier, Jacques: *See*—
Bauer, Denise; Komornicki, Jacques; and Tellier, Jacques, 4,555,343, Cl. 210-643.000.
Telmec Co., Ltd.: *See*—
Asakawa, Teruo, 4,555,650, Cl. 318-135.000.
Telspec Limited: *See*—
Hackett-Jones, Francis C.; and Kiko, Frederick H., 4,555,599, Cl. 179-170.00R.
Temple, Arthur, III: *See*—
Schmidt, Charles J., 4,554,958, Cl. 144-4.000.
Tentel Corporation: *See*—
Graham, Wayne B.; and Bonn, John, 4,554,743, Cl. 33-172.00R.
Teramachi, Hiroshi. Linear slide bearing and linear slide table using this bearing. 4,555,149, Cl. 308-6.00C.
Teschemacher, Hansjorg: *See*—
Brantl, Victor; Teschemacher, Hansjorg; Henschen, Agnes; and Lottspeich, Friedrich, 4,555,403, Cl. 514-17.000.
Tewari, Krishna: *See*—
Bronfenbrenner, James C.; Foster, Edward P.; and Tewari, Krishna, 4,555,248, Cl. 44-78.000.
Texaco Inc.: *See*—
Vanderpool, Steven H., 4,555,582, Cl. 564-479.000.
Texas Instruments Incorporated: *See*—
Pejouhy, Radi; and Cardin, Wilfred W., 4,555,686, Cl. 337-102.000.
Poteet, Ken A., 4,555,777, Cl. 365-205.000.
Slack, Douglas J., 4,555,684, Cl. 335-66.000.
Walstra, Hidde, 4,555,687, Cl. 337-370.000.
Thackrey, James D. Teeth-held head tilt alarm. 4,555,697, Cl. 340-575.000.
Theodore Sweeney & Co.: *See*—
Sweeney, Theodore J., 4,555,206, Cl. 411-23.000.
Thermometrics Inc.: *See*—
Fussell, Theodore J., 4,554,927, Cl. 128-670.000.
Thesenfitz, Klaus, to Linhoff & Thesenfitz Maschinenbau GmbH. Method of forming a storage tank for bitumen in the liquid state. 4,555,283, Cl. 156-71.000.
Thom-McI, Inc.: *See*—
Thompson, Thomas L., 4,555,292, Cl. 156-279.000.
Thomas, Calvin J.; and Hurley, James E., to Raytheon Company. Air flow system for common cavity oven. 4,555,606, Cl. 219-10.55R.
Thomas, Gunter: *See*—
Goldmann, Siegfried; Bossert, Friedrich; Schramm, Matthias; Thomas, Gunter; and Gross, Rainer, 4,555,512, Cl. 514-302.000.
Thomas, Mit. Fishing hook system having a sealed bait container, and method of making same. 4,554,756, Cl. 43-44.990.
Thomas, Rees D., to Reese Scientific Corporation. High speed test tube agitator apparatus. 4,555,183, Cl. 366-208.000.
Thompson, Thomas L., to Thom-McI, Inc. Method of forming a non-skid surface wood panel. 4,555,292, Cl. 156-279.000.
Thomson CSF: *See*—
Blanchandin, Monique; Girardat, Roland; and Vanestrenvord, Jean-Michel, 4,555,675, Cl. 330-289.000.
Thore, Thomas J., to Glenoit Mills, Inc. Pile fabric method and apparatus. 4,554,801, Cl. 66-9.00B.
Thornton, Michael G.; and Clark, Benton C., III, to Martin Marietta Corporation. Self-metering semi-automatic quantitative filtration assembly. 4,555,331, Cl. 210-99.000.
Thron, Werner: *See*—
Simon, Fritz; Korber, Klaus; Bandelow, Horst; Scherer, Michael; Wilke, Dieter; Thron, Werner; and Preuk, Gerhard, 4,554,707, Cl. 17-47.000.
Thudt, Hubert; and Winkler, Harald, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Roller guide device for use on a vehicle. 4,554,874, Cl. 104-247.000.
Thumm, Klaus A., to Stobb, Inc. Method and apparatus for handling a stack of sheets. 4,554,867, Cl. 100-3.000.
Thummel, Rudolph C.; and Fory, Werner, to Ciba-Geigy Corporation. N-Azidophenylsulfonyl-N'-pyrimidinyl ureas. 4,555,262, Cl. 71-92.000.

Thunberg, Allen L.: *See*—
LaRossa, Denise D.; Thunberg, Allen L.; Norton, Gary E.; and Dappen, Glen M., 4,555,484, Cl. 435-21.000.
TI (Group Services) Limited: *See*—
Mumford, John L. C.; and Price, Roger F., 4,555,415, Cl. 427-193.000.
Tijssen, Zwier: *See*—
deVreeze, Joop J.; Tijssen, Zwier; and Doorley, Daniel, 4,555,195, Cl. 401-218.000.
Tingley, James E., to American Sterilizer Company. Washing machine container coupling apparatus. 4,554,936, Cl. 134-146.000.
Tobia, Alfonso J.: *See*—
Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,555,571, Cl. 544-286.000.
Kanojia, Ramesh M.; Bandurco, Victor T.; Levine, Seymour D.; Mulvey, Dennis M.; and Tobia, Alfonso J., 4,555,570, Cl. 544-286.000.
Tobin, Albert G., to Grumman Aerospace Corporation. Hydrogen permeation protection for metals. 4,555,275, Cl. 148-6.300.
Tochimoto, Kunio: *See*—
Orikasa, Wataru; Tochimoto, Kunio; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; and Saito, Hiroshi, 4,555,286, Cl. 156-94.000.
Toepert, Michael: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,555,507, Cl. 514-172.000.
Tojo, Kenji: *See*—
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, 4,555,224, Cl. 418-55.000.
Tokunaga, Toshimichi: *See*—
Ishimitsu, Ikuo; Tokunaga, Toshimichi; Tanaka, Takeshi; and Anan, Yoshiaki, 4,555,126, Cl. 280-707.000.
Tokyo Electric Co., Ltd.: *See*—
Ochiai, Kuniaki, 4,555,192, Cl. 400-124.000.
Tokyo Seat Co., Ltd.: *See*—
Munakata, Shunsaku; Ukai, Hitoshi; Noguchi, Mitsuru; and Sawai, Shinichi, 4,555,380, Cl. 264-510.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hirose, Kenji, 4,555,803, Cl. 382-61.000.
Kiyotomo, Tsutomu, 4,555,086, Cl. 249-67.000.
Kurosawa, Ryoichi; and Shimamura, Takeo, 4,555,755, Cl. 363-160.000.
Nawata, Yoshiaki; and Tanimoto, Yasufumi, 4,555,653, Cl. 318-696.000.
Odawara, Kazuharu; and Tago, Yoshiaki, 4,555,716, Cl. 346-137.000.
Shirasaka, Toshio, 4,554,926, Cl. 128-663.000.
Tanaka, Tatsuo, 4,555,655, Cl. 320-1.000.
Tomishima, Yoshio: *See*—
Toyooka, Eietsu; Tomishima, Yoshio; and Nojima, Yasuhiro, 4,555,555, Cl. 526-62.000.
Tomizawa, Akira: *See*—
Tanaka, Isamu; Kikuchi, Hiroshi; Tomizawa, Akira; and Oka, Hitoshi, 4,555,532, Cl. 523-400.000.
Tomy Kogyo Company, Incorporated: *See*—
Nikaido, Teruo, 4,555,237, Cl. 446-355.000.
Topy Industries Limited: *See*—
Osawa, Shigeru; and Yamoto, Hisayoshi, 4,554,961, Cl. 152-410.000.
Toray Industries, Inc.: *See*—
Komatsu, Hideo; Harada, Hiroyuki; and Matsuki, Tomiji, 4,555,542, Cl. 524-178.000.
Sumida, Atsushi; and Watanabe, Shizuo, 4,555,446, Cl. 428-367.000.
Toray Silicone Company, Ltd.: *See*—
Saruyama, Toshio; and Mikami, Ryuzo, 4,555,560, Cl. 528-17.000.
Torazzina, Aldo: *See*—
Palara, Sergio; and Torazzina, Aldo, 4,555,674, Cl. 330-267.000.
Torelli, Guido: *See*—
Devecchi, Daniele; and Torelli, Guido, 4,555,644, Cl. 307-482.000.
Torr, Terry A.: *See*—
Fedak, John F.; Findley, Gerald I.; and Torr, Terry A., 4,555,802, Cl. 382-56.000.
Toshiba Silicone Co., Ltd.: *See*—
Kimura, Hiroshi; Mori, Ikurou; and Murai, Bunjirou, 4,555,545, Cl. 524-858.000.
Kimura, Hiroshi; Mori, Ikurou; and Murai, Bunjirou, 4,555,559, Cl. 528-16.000.
Towler Hydraulics, Inc.: *See*—
Hall, Richard W.; Sonnenberg, Sven; and Mahal, Harbhajan S., 4,555,220, Cl. 417-342.000.
Towmotor Corporation: *See*—
Melocik, Grant C.; and Pickering, William, 4,555,651, Cl. 318-341.000.
Toya, Ichizo: *See*—
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; and Toya, Ichizo, 4,555,481, Cl. 430-550.000.
Toyo Sanso Co., Ltd.: *See*—
Soneta, Eietsu; and Urata, Tetsukazu, 4,555,389, Cl. 423-210.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Hayashi, Takehiko; Ikuta, Hiroyuki; and Ohta, Takanori, 4,554,811, Cl. 72-110.000.
Toyoda, Yoshiaki; Wakimura, Kazuo; Hase, Tadaharu; and Arashiba, Nobumasa, to Mitsui Toatsu Chemicals, Incorporated. Preparation process for glyoxal. 4,555,583, Cl. 568-473.000.
Toyooka, Eietsu; Tomishima, Yoshio; and Nojima, Yasuhiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for polymerizing vinyl chloride with a scale prevention compound coated on a reaction surface. 4,555,555, Cl. 526-62.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Hamano, Hideo, 4,554,844, Cl. 74-606.00R.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Komoda, Takao, 4,554,900, Cl. 123-418.000.
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, 4,555,006, Cl. 192-0.084.
Toyota, Koji: *See*—
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,554,897, Cl. 123-188.0AA.
Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, 4,554,898, Cl. 123-188.0AA.
Tradigo, Angelo; and Tradigo, Francesco, to Giovanni Tradigo S.n.c. Extensible shoe shaper. 4,554,694, Cl. 12-136.00B.
Tradigo, Francesco: *See*—
Tradigo, Angelo; and Tradigo, Francesco, 4,554,694, Cl. 12-136.00B.
Treise, Jan E., to Rockwell International Corporation. Range reply search apparatus. 4,555,704, Cl. 343-7.300.
Tribe, Leonard T.: *See*—
Frait, John S.; Lowman, Clark E.; Morris, George W., III; and Tribe, Leonard T., 4,555,120, Cl. 280-6.100.
Troutman, Ronald R.: *See*—
Bansal, Jai P.; Bertin, Claude L.; and Troutman, Ronald R., 4,555,721, Cl. 357-42.000.
Tru Test Distributors Limited: *See*—
Sealey, Graham P.; and Corney, Andrew C., 4,554,831, Cl. 73-304.00R.
Trutzschler GmbH & Co. KG: *See*—
Leifeld, Ferdinand; Coenen, Rolf; Oelering, Werner; and Klopp, Ludwig, 4,554,708, Cl. 19-80.00R.
TRW Inc.: *See*—
Dier, Stephen A., 4,554,817, Cl. 72-370.000.
Tsuruoka, Takashi: *See*—
Nishihata, Ken; Iinuma, Katsuharu; Yamada, Hitoshi; Hirano, Fumiya; and Tsuruoka, Takashi, 4,555,404, Cl. 514-201.000.
Tsuruta, Yuzo, to Kabushiki Kaisha Sunpak. Coupling mechanism of photographic flash device. 4,555,747, Cl. 362-3.000.
Tsutsumi, Masataka; and Frohman, Richard J., to Midwestern Industries, Inc. Method and apparatus for separating material. 4,555,330, Cl. 209-254.000.
Tuhro, Richard H., to Xerox Corporation. Image sensor correction system. 4,555,732, Cl. 358-213.000.
Tukahara, Ryoichi: *See*—
Yamada, Yasuyuki; Tanaka, Tadaaki; Tukahara, Ryoichi; and Nishizawa, Tsutomu, 4,555,355, Cl. 252-299.100.
Tune, John B.: *See*—
Clarke, David E.; Davies, James F.; Smart, Colin; and Tune, John B., 4,555,354, Cl. 252-90.000.
Tung, Raymond T.: *See*—
Gibson, John M.; Jacobson, Dale C.; Poate, John M.; and Tung, Raymond T., 4,555,301, Cl. 156-617.00R.
Turbo-Werk Messtechnik GmbH: *See*—
Doll, Friedhelm, 4,554,828, Cl. 73-202.000.
Turnbull, Clyde D., to Hunt Manufacturing Co. Work station. 4,555,150, Cl. 312-250.000.
Tverdokhleb, Nikolai F.: *See*—
Vasiliev, Leonard L.; Kiselev, Vladimir G.; Morgun, Valery A.; Marchenko, Anatoly M.; Rudnev, Evgeny A.; Nesvit, Vasily A.; Dunaevsky, Leonid M.; Tverdokhleb, Nikolai F.; Bogdanov, Vladimir M.; and Rabetsky, Mikhail I., 4,554,966, Cl. 165-104.210.
TVI Systems, Ltd.: *See*—
Bedini, John C., 4,555,795, Cl. 381-17.000.
Twinpak, Inc.: *See*—
Canning, Howard; and Weber, Peter, 4,555,804, Cl. 383-25.000.
Twisselmann, Lorenz, to VDO Adolf Schindling AG. Device for converting electric signals into pneumatic signals. 4,554,938, Cl. 137-82.000.
Tyler Refrigeration Corporation: *See*—
Ibrahim, Fayez F., 4,554,795, Cl. 62-175.000.
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic engine stop and start system. 4,555,006, Cl. 192-0.084.
Uchida, Yoshiyuki: *See*—
Fujisawa, Hakubun; Nishiura, Masaharu; Haruki, Hiromu; and Uchida, Yoshiyuki, 4,555,636, Cl. 250-578.000.
Uchiyama, Kaoru, to Fuji Photo Film Co., Ltd. Film handling device. 4,555,076, Cl. 242-195.000.
Ueda, Akio; Akita, Shuichi; and Namizuka, Toshio, to Nippon Zeon Co. Ltd. Rubber composition for tire treads. 4,555,547, Cl. 525-237.000.
Ueda, Akio; Akita, Shuichi; and Chida, Takeshi, to Nippon Zeon Co. Ltd. Rubber composition for tire treads. 4,555,548, Cl. 525-237.000.
Ueeda, Ryuhei; Fujii, Kiyonobu; and Narukawa, Hiroshi, to Kuraray Company, Ltd. Tough thermoplastic resin sheet-like material. 4,555,439, Cl. 428-221.000.
Uemura, Yahiro: *See*—
Arimura, Hirofumi; Uemura, Yahiro; and Okuno, Yoshiomi, 4,555,401, Cl. 424-89.000.
Ueno, Mitsushi; Shirogami, Tamotsu; and Mikogami, Yukihiro, to Kabushiki Kaisha Toshiba. Porous gas diffusion electrode and method of producing the same. 4,555,324, Cl. 204-284.000.

Ueura, Akira: *See—*
Maeda, Yoshiyasu; Ueura, Akira; Sato, Kazuyoshi; and Watanabe, Katsunori, 4,555,069, Cl. 242-43.00R.

Ukai, Hitoshi: *See—*
Munakata, Shunsaku; Ukai, Hitoshi; Noguchi, Mitsuru; and Sawai, Shinichi, 4,555,380, Cl. 264-510.000.

Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; and Toya, Ichizo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsions containing benzimidazolocarbocyanine dye having fluoroalkyl group at the nitrogen atom of benzimidazole. 4,555,481, Cl. 430-550.000.

Ukigai, Toshiyuki: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,555,351, Cl. 252-8.55D.

Umeda, Yasukazu, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for operating an elevator. 4,555,000, Cl. 187-29.00R.

Umehara, Akira: *See—*
Kawamura, Kouichi; Aotani, Yoshimasa; and Umehara, Akira, 4,555,474, Cl. 430-281.000.

Umeno, Hiroshi; Saito, Gunji; and Hayashida, Morimasa, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission apparatus in mobile type lawn mower. 4,554,780, Cl. 56-11.800.

Unimation, Inc.: *See—*
Shulman, Burt H., 4,555,613, Cl. 219-124.340.

Union Carbide Corporation: *See—*
Atkins, Kenneth E., 4,555,534, Cl. 523-507.000.
Koleske, Joseph V.; Peacock, Glenn S.; and Kwiatkowski, George T., 4,555,449, Cl. 428-411.100.
Rosen, Meyer R.; Fan, You-Ling; and Chu, Nan S., 4,555,346, Cl. 210-734.000.

Union Nationale des Cooperatives Agricoles de Transformation de la Betterave: *See—*
Ponant, Jacques, 4,555,270, Cl. 127-44.000.

Union Oil Company of California: *See—*
Robinson, Paul R.; and Moorehead, Eric L., 4,555,584, Cl. 585-623.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Kirby-Smith, Trevor R., 4,554,827, Cl. 73-189.000.

United States of America
Air Force: *See—*
Harvell, John K.; and Franke, Milton E., 4,555,079, Cl. 244-207.000.
Sage, Jay P., 4,555,770, Cl. 364-819.000.
Waineo, Douglas K.; and Wong, Sam S., 4,555,708, Cl. 343-799.000.
Army: *See—*
Lilley, Jay S., 4,554,823, Cl. 73-116.000.
Vig, John R.; and Ballato, Arthur, 4,554,717, Cl. 29-25.350.
Energy: *See—*
Beitz, James V., 4,555,318, Cl. 204-157.10R.
Borden, Albert R., 4,554,731, Cl. 29-605.000.
Duchane, David V.; and Barthell, Barry L., 4,555,313, Cl. 204-3.000.
McRae, Thomas G., Jr., 4,555,627, Cl. 250-334.000.
Moore, David S.; and Schmidt, Stephen C., 4,555,176, Cl. 356-301.000.
Scribner, Kenneth J., 4,555,277, Cl. 149-19.400.
Steinberg, Meyer, 4,555,392, Cl. 423-244.000.
Health and Human Services: *See—*
Merril, Carl R., 4,555,490, Cl. 436-86.000.
Interior: *See—*
Eisenhauer, Roy J.; Loeser, Cary A.; and Goodner, Charles G., Jr., 4,554,822, Cl. 73-61.00R.
National Aeronautics and Space Administration: *See—*
Smyly, Harold M.; Miller, Charles D.; Cloyd, Richard A.; and Heller, Clarence, 4,554,905, Cl. 124-56.000.
Navy: *See—*
Barrett, Terence W., 4,555,177, Cl. 356-318.000.
Cantrell, Ben H., 4,555,703, Cl. 343-5.0SA.
Collins, David A.; Lile, Derek L.; and Zeisse, Carl R., 4,555,273, Cl. 148-1.500.
Fletcher, Aaron N.; McManis, George E., III; and Bliss, Dan E., 4,555,455, Cl. 429-112.000.
McClain, D. Wayne, 4,555,130, Cl. 285-26.000.
Morris, Richard A.; Lukens, William E.; and Zanis, Charles A., 4,555,614, Cl. 219-130.010.
Rudd, Michael J., 4,554,836, Cl. 73-657.000.
Teeter, Brent A., 4,555,726, Cl. 358-93.000.

U.S. Philips Corporation: *See—*
de Willigen, Hans C.; and Kokken, Johannes E., 4,555,148, Cl. 308-6.00R.
Ditscheid, Hans L., 4,555,227, Cl. 425-122.000.
Driessen, Leonardus M. H. E., 4,555,729, Cl. 358-133.000.
Harms, Margret; Bruns, Angelika; Luthje, Holger; and Matthiessen, Bernd, 4,555,460, Cl. 430-5.000.
Khoe, Giok D.; and van Heuven, Johannes H. C., 4,555,810, Cl. 455-612.000.
Martens, Gerhard, 4,555,631, Cl. 250-551.000.
Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; Sanders, Georgius B. J.; and van Nieuwland, Jacob M., 4,555,797, Cl. 381-117.000.
Op de Beek, Johannes C. A.; and Lobregt, Steven, 4,555,760, Cl. 364-414.000.
Readhead, John B., 4,555,720, Cl. 357-30.000.
Roschmann, Peter, 4,555,374, Cl. 264-40.100.
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,555,676, Cl. 330-298.000.
Van Tol, Nicolaas, 4,555,792, Cl. 375-62.000.

United Technologies Corporation: *See—*
Jeffery, Philip A. E.; and Luecke, Greg R., 4,555,219, Cl. 416-158.000.

University of Minnesota, Regents of the: *See—*
Cussler, Edward L., 4,555,344, Cl. 210-670.000.

Unterreiner, Ronald C.: *See—*
Graetz, Herbert; and Unterreiner, Ronald C., 4,555,290, Cl. 156-245.000.

UOP Inc.: *See—*
Ward, Dennis J., 4,555,311, Cl. 203-21.000.

Uram, John R., Jr., to Goodyear Aerospace Corporation. Moisture-resistant transparent mercaptan compositions. 4,555,450, Cl. 428-412.000.

Urata, Tetsukazu: *See—*
Soneta, Eietsu; and Urata, Tetsukazu, 4,555,389, Cl. 423-210.000.

Urban, Klaus: *See—*
Jablonka, Dieter; Urban, Klaus; Raidt, Heinz-Peter; and Schepers, Eberhard, 4,555,433, Cl. 428-166.000.

Urbanik, John C. Method and apparatus for ultrasonic etching of printing plates. 4,555,302, Cl. 156-637.000.

Urbanski, Janet B.: *See—*
Frey, Gary T.; Strong, Douglas H.; and Urbanski, Janet B., 4,555,445, Cl. 428-340.000.

Usuki, Hiroshi; and Taniguchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Interconnection system between image pickup device and recording device. 4,555,735, Cl. 358-330.000.

USV Pharmaceutical Corp.: *See—*
Suh, John T.; Regan, John R.; Piwinski, John J.; Menard, Paul; and Jones, Howard, 4,555,508, Cl. 514-211.000.

Vachiery, Edmond: *See—*
Gueussier, Andre; and Vachiery, Edmond, 4,555,265, Cl. 75-53.000.

Vachon, Bertrand, to Ber-Vac Inc. Combined harrow and harrow bar. 4,554,977, Cl. 172-177.000.

Valehrach, Emil M., to Karsten Solheim. Apparatus for compression testing and sorting golf balls. 4,555,028, Cl. 209-599.000.

Valet, Jean-Yves: *See—*
Vegeais, Patrick; Brot, Michel; and Valet, Jean-Yves, 4,555,715, Cl. 346-76.0PH.

Vallourec: *See—*
Gueussier, Andre; and Vachiery, Edmond, 4,555,265, Cl. 75-53.000.

van Arragon, Gerrit W.: *See—*
Boute, Wim; Wittkampf, Frederik H. M.; and van Arragon, Gerrit W., 4,554,921, Cl. 128-419.0PG.

Vandebult, Jan: *See—*
Hoover, Merwin F.; Salamone, Ann B.; and Vandebult, Jan, 4,555,414, Cl. 427-43.100.

van de Plassche, Rudy J.; and Dijkmans, Eise C., to U.S. Philips Corporation. Dual-section amplifier arrangement having a protection circuit. 4,555,676, Cl. 330-298.000.

van de Plassche, Rudy J.: *See—*
Huijsing, Johan H.; and van de Plassche, Rudy J., 4,555,673, Cl. 330-258.000.

Vanderpool, Steven H., to Texaco Inc. Catalytic preparation of linear polyethylenepolyamines [with supported catalyst]. 4,555,582, Cl. 564-479.000.

Vanestrenvord, Jean-Michel: *See—*
Blanchandin, Monique; Girardat, Roland; and Vanestrenvord, Jean-Michel, 4,555,675, Cl. 330-289.000.

van Gijsel, Wilhelmus D. A. M.: *See—*
Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; Sanders, Georgius B. J.; and van Nieuwland, Jacob M., 4,555,797, Cl. 381-117.000.

van Heuven, Johannes H. C.: *See—*
Khoe, Giok D.; and van Heuven, Johannes H. C., 4,555,810, Cl. 455-612.000.

Vann, Roy R.; and George, Flint R., to GEO VANN, Inc. Hold down apparatus for wireline operated gun. 4,554,975, Cl. 166-297.000.

van Nieuwland, Jacob M.: *See—*
Nieuwendijk, Joris A. M.; van Gijsel, Wilhelmus D. A. M.; Sanders, Georgius B. J.; and van Nieuwland, Jacob M., 4,555,797, Cl. 381-117.000.

Van Raaij, Karel W. M. Vacuum street sweeper and filter apparatus therefor. 4,554,701, Cl. 15-340.000.

Van Tol, Nicolaas, to U.S. Philips Corporation. Transmitter for transmitting an FSK-modulated signal. 4,555,792, Cl. 375-62.000.

Varian Associates, Inc.: *See—*
Miram, George V.; and Mizuhara, Yosuke M., 4,555,646, Cl. 315-5.350.

Vasiliev, Leonard L.; Kiselev, Vladimir G.; Morgun, Valery A.; Marchenko, Anatoly M.; Rudnev, Evgeny A.; Nesvit, Vasily A.; Dunaevsky, Leonid M.; Tverdokhleb, Nikolai F.; Bogdanov, Vladimir M.; and Rabetsky, Mikhail I. Heat-transfer device. 4,554,966, Cl. 165-104.210.

Vatter, Rudolf: *See—*
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,554,715, Cl. 28-107.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,424, Cl. 428-91.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,425, Cl. 428-91.000.

VDO Adolf Schindling AG: *See*—
Twisselmann, Lorenz, 4,554,938, Cl. 137-82.000.

VE Fleischkombinat Berlin: *See*—
Simon, Fritz; Korber, Klaus; Bandelow, Horst; Scherer, Michael; Wilke, Dieter; Thron, Werner; and Preuk, Gerhard, 4,554,707, Cl. 17-47.000.

VEB Forst: *See*—
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,424, Cl. 428-91.000.

VEB Forster Tuchfabriken: *See*—
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,554,715, Cl. 28-107.000.

VEB Kombinat Textima: *See*—
Ploch, Siegfrid; Rossler, Sonja; Zeisberg, Peter; and Heilmann, Horst, 4,554,804, Cl. 66-214.000.

Vecellio, Anthony M., to General Motors Corporation. Lightweight engine. 4,554,893, Cl. 123-41.830.

Vector Corporation: *See*—
Yoakam, David; Campbell, Robert; and Pehkonen, Robert, 4,554,887, Cl. 118-666.000.

Vegeais, Patrick; Brot, Michel; and Valet, Jean-Yves, to Societe d'Applications Generales d'Electricite et de Mecaniques Sagem. Thermal printhead mounting control. 4,555,715, Cl. 346-76.0PH.

Vereinigte Edelstahlwerke Aktiengesellschaft (VEW): *See*—
Kern, Hans; and Haslberger, Richard, 4,554,939, Cl. 137-99.000.

VEV Forster Tuchfabriken: *See*—
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,425, Cl. 428-91.000.

Victor Company of Japan: *See*—
Namiki, Yasuomi, 4,555,669, Cl. 330-149.000.

Victor Company of Japan, Ltd.: *See*—
Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Takahashi, Toshinori; Kato, Shigeru; Kiuchi, Tsutomu; and Kitamura, Hiroki, 4,555,714, Cl. 346-76.0PH.

Videojet Systems International, Inc.: *See*—
Arway, George; Eremity, Frank; Dick, George; and Pullen, Elaine, 4,555,712, Cl. 346-75.000.
Arway, George; Eremity, Frank; and Huang, Tung M., 4,555,719, Cl. 346-140.00R.

Vig, John R.; and Ballato, Arthur, to United States of America, Army. Method of making miniature high frequency SC-cut quartz crystal resonators. 4,554,717, Cl. 29-25.350.

Vilter Manufacturing Corporation: *See*—
Pallanch, Francis T., 4,554,799, Cl. 62-509.000.

Visser, Huibert: *See*—
Klumper, Jan W.; and Visser, Huibert, 4,555,181, Cl. 356-448.000.

Vitafin N.V.: *See*—
Boute, Wim; Wittkampf, Frederik H. M.; and van Arragon, Gerrit W., 4,554,921, Cl. 128-419.0PG.

Vitro Tec Fideicomiso: *See*—
Curiel, Jesus V., 4,555,258, Cl. 65-319.000.

Vitrotex Saint-Gobain: *See*—
Bloemkolk, Willem, deceased; and Blanc, Andre , 4,555,373, Cl. 264-25.000.

Vockenhuber, Peter, to AGFA-Gevaert A.G. Method and apparatus for ascertaining the dimensions and positions of film frames on coherent roll films. 4,555,632, Cl. 250-560.000.

Voest-Alpine AG: *See*—
Schiefer, Bernhard; and Bumberger, Herbert, 4,555,050, Cl. 222-597.000.

Voest-Alpine Aktiengesellschaft: *See*—
Hirschmanner, Franz; Buchegger, Rudolf; and Brettbacher, Franz, 4,554,812, Cl. 72-202.000.
Wrulich, Herwig; Schetina, Otto; Siebenhofer, Gottfried; and Maier, Wilfried, 4,555,143, Cl. 299-81.000.

Volkheimer, Klaus: *See*—
Lange, Wolf-Ruediger; Wessel, Anton; Bohler, Udo; Volkheimer, Klaus; Greiner, Gunter; and Islet, Peter, 4,555,806, Cl. 455-62.000.

Voltmer, Helmut; Schwenzer, Alfred F.; and Mazur, Edward J., to NJM, Inc. Literature applying mechanism. 4,555,299, Cl. 156-552.000.

von Au, Gunter: *See*—
Huhn, Karl; and von Au, Gunter, 4,555,419, Cl. 427-387.000.

von Herrmann, Pieter J.: *See*—
Leskovec, Robert A.; Davenport, John M.; and von Herrmann, Pieter J., 4,555,647, Cl. 315-179.000.

von Lersner, Wolf A.; Cheeseman, Edward W.; Simpson, Thomas K.; and Weaver, George R., to Campbell Soup Company. Method and apparatus for assembling food ingredients. 4,554,955, Cl. 141-1.000.

von Winnicki, Kalixt, to Siemens Aktiengesellschaft. Current supply device for series-fed electronic circuits. 4,555,660, Cl. 323-224.000.

Vortec Corporation: *See*—
Collins, C. Neal; and Peter, Joseph E., 4,555,059, Cl. 239-425.000.

Voso, Philip T.: *See*—
Weinberg, Alan S.; Wofford, B. Gary; and Voso, Philip T., 4,555,025, Cl. 206-497.000.

Voss, Jurgen; Dombkowski, Otto; Kudlich, Walter; and Stodulka, Jan, to Wacker-Chemie GmbH. Packaging unit for semiconductor wafers. 4,555,024, Cl. 206-454.000.

Vredestein N.V.: *See*—
Lemmens, Rudolphus P. M., 4,554,882, Cl. 114-219.000.

Vuilleumier, Cyril, to Omega SA. Time setting mechanism for a timepiece having an analog mechanical display. 4,555,185, Cl. 368-190.000.

W & A Bates Ltd.: *See*—
Goodfellow, Anthony G., 4,555,287, Cl. 156-127.000.

W. H. Bossons (Sales) Limited: *See*—
Bossons, William R., 4,555,432, Cl. 428-156.000.

W. R. Grace & Co., Cryovac Div.: *See*—
Weinberg, Alan S.; Wofford, B. Gary; and Voso, Philip T., 4,555,025, Cl. 206-497.000.

W. Schlafhorst & Co.: *See*—
Kamp, Heinz, 4,555,068, Cl. 242-36.000.
Raasch, Hans; and Grecksch, Hans, 4,555,215, Cl. 414-564.000.

Wachi, Masatada; and Katoh, Mitsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Digital filter for an electronic musical instrument. 4,554,858, Cl. 84-1.190.

Wacker-Chemie GmbH: *See*—
Huhn, Karl; and von Au, Gunter, 4,555,419, Cl. 427-387.000.
Voss, Jurgen; Dombkowski, Otto; Kudlich, Walter; and Stodulka, Jan, 4,555,024, Cl. 206-454.000.

Wacker Corporation: *See*—
Miller, William J.; and Faber, Norman, Jr., 4,555,238, Cl. 464-52.000.

Wagener, Hans H.: *See*—
Gruber, Klaus; Lohner, Manfred; Posselt, Klaus; and Wagener, Hans H., 4,555,524, Cl. 514-570.000.

Wagner, Theodor M., to RCA Corporation. Complementary color splitting filters used in a color camera. 4,555,163, Cl. 350-172.000.

Wahnberger, Dieter: *See*—
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,554,715, Cl. 28-107.000.
Reim, Ingeborg; Pohl, Gerhard; Gotzke, Wolfgang; Wahnberger, Dieter; Postel, Lothar; Kindlein, Irmgard; Vatter, Rudolf; and Greschke, Manfred, 4,555,424, Cl. 428-91.000.
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Waineo, Douglas K.; and Wong, Sam S., to United States of America, Air Force. Dipole ring array antenna for circularly polarized pattern. 4,555,708, Cl. 343-799.000.

Wakai, Kiyoshi: *See*—
Fukushima, Yoneharu; and Wakai, Kiyoshi, 4,555,690, Cl. 340-52.00F.

Wakimura, Kazuo: *See*—
Toyoda, Yoshiaki; Wakimura, Kazuo; Hase, Tadaharu; and Arashiba, Nobumasa, 4,555,583, Cl. 568-473.000.

Wakui, Tadahiro; and Handa, Tadahiko, to Daido Sanso K. K. Method for producing hydrocarbons. 4,555,526, Cl. 518-717.000.

Wakui, Yoshio; Negishi, Kiyoshi; and Tano, Eiichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Device for illuminating display unit in viewfinder. 4,555,170, Cl. 354-470.000.

Waldman, Donald J.: *See*—
Gibson, Dennis H.; Stockner, Alan R.; and Waldman, Donald J., 4,554,901, Cl. 123-450.000.

Waldo, Paul D.: *See*—
McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., 4,555,759, Cl. 364-300.000.

Waldvogel, Hartmut: *See*—
Borel, Georg; and Waldvogel, Hartmut, 4,554,953, Cl. 139-383.00A.

Walker, Fritz: *See*—
Goller, Ernst; Ploppa, Jurgen; and Walker, Fritz, 4,554,802, Cl. 66-71.000.

Wall, Llewellyn E.: *See*—
Bridgewater, Walter F.; De Caro, Robert E.; Larson, Roger; and Wall, Llewellyn E., 4,555,623, Cl. 250-214.00A.

Wallace Companies, Inc., The: *See*—
Lam, Ping H., 4,555,158, Cl. 339-99.00R.

Wallace, Jesse T.: *See*—
Le Van, Dien; and Wallace, Jesse T., 4,555,739, Cl. 360-103.000.

Wallner, Josef; and Kelterbaum, Manfred, to Elastogran Maschinenbau GmbH. Split mold for multi-component plastics, especially polyurethanes. 4,555,087, Cl. 249-78.000.

Walstra, Hidde, to Texas Instruments Incorporated. Fuel supply system with electric choke and control therefor. 4,555,687, Cl. 337-370.000.

Walter, Ernest J. Interchangeable identification apparatus for racing animals and event contestants and method for making same. 4,555,435, Cl. 428-79.000.

Walter Meier: *See*—
Meier, Walter; and Jacobsen, Jan, 4,555,168, Cl. 353-7.000.

Walton, Herbert H.: *See*—
Claney, Robert L.; Walton, Herbert H.; Kehoe, Steven D.; and Barron, Kimball R., 4,554,943, Cl. 137-242.000.

Wambaugh, John O.: *See*—
Shonrock, Clinton O.; and Wambaugh, John O., 4,554,973, Cl. 166-192.000.

Wang, Kuei-Hsiung: *See*—
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Ward, Dennis J., to UOP Inc. Integrated fractionation in the recovery of alkylaromatic hydrocarbons. 4,555,311, Cl. 203-21.000.

Ward, Harold T.: *See*—
Carter, Eric L.; and Ward, Harold T., 4,555,769, Cl. 364-746.000.

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Byrne, David S.; and Chen, Evan N., 4,555,030, Cl. 211-49.100.

Capps, David B., 4,555,572, Cl. 546-14.000.
Chen, Evan N., 4,554,735, Cl. 30-47.000.
Washburn, William N., to Eastman Kodak Company. Photographic element and process utilizing metal complex color masking dyes. 4,555,477, Cl. 430-359.000.
Watanabe, Isao: *See*—
Okada, Seiji; Watanabe, Isao; Sawatari, Norio; Saito, Kazumasa; Narusawa, Toshiaki; and Okuyama, Hirofumi, 4,555,466, Cl. 430-106.600.
Watanabe, Katsunori: *See*—
Maeda, Yoshiyasu; Ueura, Akira; Sato, Kazuyoshi; and Watanabe, Katsunori, 4,555,069, Cl. 242-43.00R.
Watanabe, Shizuo: *See*—
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Waterman, Raymond C., Jr.: *See*—
Galani, Zvi; Laton, Richard W.; Waterman, Raymond C., Jr.; and DiBiase, Robert, 4,555,678, Cl. 331-1.00A.
Watson, David R.; Carithers, Val G.; and McDaniel, L. Thomas, to Reynolds Metals Company. Aluminosilicate ceramic proppant for gas and oil well fracturing and method of forming same. 4,555,493, Cl. 501-127.000.
Watson, Keith G.: *See*—
Serban, Alexander; Watson, Keith G.; Bird, Graham J.; Farquharson, Graeme J.; and Houston, Timothy L., 4,555,263, Cl. 71-98.000.
Watt, James. Rotary proportioning inhalator. 4,554,916, Cl. 128-203.120.
Weaver, George R.: *See*—
von Lersner, Wolf A.; Cheeseman, Edward W.; Simpson, Thomas K.; and Weaver, George R., 4,554,955, Cl. 141-1.000.
Weber, Peter: *See*—
Canning, Howard; and Weber, Peter, 4,555,804, Cl. 383-25.000.
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Bruns, Klaus; and Weber, Ursula, 4,555,359, Cl. 252-522.00R.
Webster, Wilton W., Jr. Electrophysiological switching unit. 4,554,928, Cl. 128-709.000.
Weeks, Vaughan B.: *See*—
Carter, Garry L.; and Weeks, Vaughan B., 4,554,687, Cl. 4-144.200.
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Fischer, Herbert; Gorzinski, Manfred; Gress, Wolfgang; Meffert, Alfred; and Wegemund, Bernd, 4,555,564, Cl. 528-295.300.
Weigand, Francis K.; and Nickel, William H., to Garrett Corporation, The. Emergency power unit and method. 4,554,784, Cl. 60-39.020.
Weinberg, Alan S.; Wofford, B. Gary; and Voso, Philip T., to W. R. Grace & Co., Cryovac Div. Shrink bag with integral handle. 4,555,025, Cl. 206-497.000.
Weiner, Robert I. Ladder safety indicator. 4,554,994, Cl. 182-18.000.
Weinhold, Karl. Coupling for connecting hose or pipe ends. 4,555,131, Cl. 285-91.000.
Weinstein, Richard; Davis, James W.; and Campbell, Robert K., to Champion Spark Plug Company. Rotary atomizer coater. 4,555,058, Cl. 239-223.000.
Weise, Lutz: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; Bleckmann, Hans-Wilhelm; and Weise, Lutz, 4,555,144, Cl. 303-92.000.
Weishalla, Gale F., to Pride Machine, Inc. Tool pack assembly. 4,554,815, Cl. 72-349.000.
Weiss, Hans: *See*—
Steiner, Karl; Schiel, Christian; Meinecke, Albrecht; Mullner, Josef; and Weiss, Hans, 4,555,305, Cl. 162-205.000.
Weller, Otto: *See*—
Denk, Josef; Dietrich, Walter; and Weller, Otto, 4,554,777, Cl. 53-201.000.
Wells, Martin A.: *See*—
Butterworth, Robert M.; and Wells, Martin A., 4,555,349, Cl. 252-8.600.
Wells, William, to Korf Technologies, Inc. Method and apparatus for treating liquid metal in a vessel. 4,555,266, Cl. 75-53.000.
Wendt, Hans: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,555,507, Cl. 514-172.000.
Wennberg, Timothy J.: *See*—
Hewett, Gary E.; Atwood, Brian G.; and Wennberg, Timothy J., 4,554,839, Cl. 73-864.160.
Wenning, Thomas J.; and Lynn, Charles E., to Goodyear Tire & Rubber Company, The. Rubberized ball rod stud for automotive steering assembly. 4,555,198, Cl. 403-130.000.
Wessel, Anton: *See*—
Lange, Wolf-Ruediger; Wessel, Anton; Bohler, Udo; Volkheimer, Klaus; Greiner, Gunter; and Islet, Peter, 4,555,806, Cl. 455-62.000.
Wessel, Wolf: *See*—
Engel, Gerhard; and Wessel, Wolf, 4,554,899, Cl. 123-357.000.
Westermeir, Gisela; and Fehr, Friedhard, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Thick-film capacitor manufactured by printed-circuit techniques. 4,555,745, Cl. 361-320.000.
Westervelt, Dean C.; and Burke, Thomas M., to Westinghouse Electric Corp. Method of making a void-free non-cellulose electrical winding. 4,554,730, Cl. 29-605.000.
Westinghouse Electric Corp.: *See*—
Brick, Michael J.; and Dirnberger, Linus R., 4,555,689, Cl. 340-19.00R.
Dominick, Thomas S.; and Anderson, Roy G., 4,555,681, Cl. 333-112.000.
Dorman, William J., 4,555,757, Cl. 364-165.000.
Enriquez, Emanuel E., 4,555,724, Cl. 358-93.000.
Gottlieb, Milton; and Steinbruegge, Kenneth B., 4,555,160, Cl. 350-358.000.
Gyugyi, Laszlo, 4,555,659, Cl. 323-210.000.
Hwang, Eddie Y.; Szabo, Andras I.; and Shung, Wu-shi, 4,554,788, Cl. 60-646.000.
Lilly, Gerard P., 4,554,889, Cl. 122-32.000.
Maier, Alfred E.; and Ricci, Louis N., 4,555,604, Cl. 200-255.000.
Westervelt, Dean C.; and Burke, Thomas M., 4,554,730, Cl. 29-605.000.
Whirlpool Corporation: *See*—
Khan, Aman U., 4,554,794, Cl. 62-150.000.
Lyman, John B., 4,554,700, Cl. 15-323.000.
Overley, Ronald V.; Tedhams, Michael H.; and Atzbach, Carl L., 4,554,907, Cl. 126-191.000.
White Consolidated Industries, Inc.: *See*—
Mawby, Harold S.; and Frisbie, Carl W., 4,555,049, Cl. 222-517.000.
Stankard, James M., 4,554,796, Cl. 62-326.000.
White, Jackie L.: *See*—
Conrad, Lucas J.; and White, Jackie L., 4,554,932, Cl. 131-296.000.
White, Mary N.: *See*—
Hefner, Robert E., Jr.; and White, Mary N., 4,555,563, Cl. 528-96.000.
White, Stephen R.; and Feinberg, Jeffrey N. Foldable support stand. 4,555,128, Cl. 281-45.000.
White, Thomas C. Ocular pressure relief device. 4,554,918, Cl. 604-10.000.
Whitehead, Larry W., to Leggett & Platt, Incorporated. Adjustable box spring retainer bracket. 4,554,692, Cl. 5-411.000.
Whiteside, Robert C.; Arends, Albert W.; and Karklin, Roland, to Leesona Corporation. Thermoforming methods and apparatus. 4,555,377, Cl. 264-292.000.
Wicks, John L., to AMP Incorporated. Selective plating apparatus. 4,555,321, Cl. 204-224.00R.
Wiechert, Rudolf: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toeperi, Michael; and Wendt, Hans, 4,555,507, Cl. 514-172.000.
Wiedemann, Ingrid: *See*—
Schnorrenberg, Gerd; Roos, Otto; Losel, Walter; Wiedemann, Ingrid; Gaida, Wolfram; and Hoefke, Wolfgang, 4,555,511, Cl. 514-301.000.
Wigram, Stig. Spreader device in a storage container for uniform filling of the container with granular storage goods. 4,555,210, Cl. 414-301.000.
Wihl, Mark J.: *See*—
Broadbent, William H., Jr.; Buchholz, Steve; Eldredge, Peter; and Wihl, Mark J., 4,555,798, Cl. 382-8.000.
Wilhelm, Camille; Wilhelm, Camille; and Wilhelm, Robert. Supercharged internal combustion engine. 4,554,787, Cl. 60-605.000.
Wilhelm, Camille: *See*—
Wilhelm, Camille; Wilhelm, Camille; and Wilhelm, Robert, 4,554,787, Cl. 60-605.000.
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Wilke, Dieter: *See*—
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Willcocks, Kenneth: *See*—
Evans, John M.; Buckingham, Robin E.; and Willcocks, Kenneth, 4,555,509, Cl. 514-278.000.
Williams, Inc.: *See*—
Hagen, Glenn E., 4,555,307, Cl. 202-177.000.
Williams, Robert G. Convex radius gauge. 4,554,747, Cl. 33-553.000.
Williams, Todd E.; and Desch, Steven M., to Advanced Micro Devices, Inc. Process gas controller. 4,554,942, Cl. 137-240.000.
Williamson, Terence J., to Burwell, Reed & Kinghorn Limited. Component. 4,555,259, Cl. 65-374.120.
Wilson Sporting Goods Company: *See*—
Masghati, Mohammad, 4,555,112, Cl. 273-77.00A.
Wimmerstedt, Roland V.: *See*—
Jonsson, Ernst U.; Lindqvist, Sten-Borje; and Wimmerstedt, Roland V., 4,555,251, Cl. 55-48.000.
Winkler, Harald: *See*—
Thudt, Hubert; and Winkler, Harald, 4,554,874, Cl. 104-247.000.
Winston, Scott, to Hercules Incorporated. High density pressure resistant invert blasting emulsions. 4,555,276, Cl. 149-6.000.
Winter, Joseph; and Pryor, Michael J., to Olin Corporation. Process and apparatus for fabricating optical fiber cables. 4,555,054, Cl. 228-148.000.
Wion, Donald A.: *See*—
Over, William R.; Wion, Donald A.; and Heffner, Richard M., 4,554,725, Cl. 29-564.400.
Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Lee, Seok H.; and Phelps, Mary E., 4,555,364, Cl. 260-397.200.
Wittkampf, Frederik H. M.: *See*—
Boute, Wim; Wittkampf, Frederik H. M.; and van Arragon, Gerrit W., 4,554,921, Cl. 128-419.0PG.
Witzke, Horst: *See*—
Deckman, Harry W.; Witzke, Horst; Wronski, Christopher; and Yablonovitch, Eli, 4,554,727, Cl. 29-572.000.

Wofford, B. Gary: *See—*
Weinberg, Alan S.; Wofford, B. Gary; and Voso, Philip T., 4,555,025, Cl. 206-497.000.

Wohrstein, Franz X.: *See—*
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Wolf, Marvin L.: *See—*
Mick, Jon L.; and Wolf, Marvin L., 4,555,032, Cl. 212-189.000.

Wolfert, Clarke K., to Air Vent Inc. Roof ridge ventilator for retarding microbe growth in shingle roofs. 4,554,862, Cl. 98-42.210.

Wolowski, Eckard; and Mirtsch, Frank, to Ruhrkohle Aktiengesellschaft. Method for interconnecting thermally and pressure-stressed multi-phas.. reactors. 4,555,325, Cl. 208-10.000.

Womack, Darryl L.; Noell, Ralph B.; and Bradshaw, Larry R., to Scott Orthopedics, Inc. Adjustable joint for a knee brace. 4,554,913, Cl. 128-80.00C.

Wong, Albert H., to Wong Technology, Inc. Protective enclosure having self-contained air supply. 4,554,683, Cl. 2-202.000.

Wong, Rayman Y., to Stauffer Chemical Co. Pyridylpropyl carbamates as insect repellents. 4,555,515, Cl. 514-357.000.

Wong, Sam S.: *See—*
Waineo, Douglas K.; and Wong, Sam S., 4,555,708, Cl. 343-799.000.

Wong Technology, Inc.: *See—*
Wong, Albert H., 4,554,683, Cl. 2-202.000.

Wood, David B., III, to Cincinnati Milacron Inc. Anti-backlash mechanism for machine drive. 4,554,842, Cl. 74-409.000.

Wood, Roger W., to Ampex Corporation. Parity and syndrome generation for error detection and correction in digital communication systems. 4,555,784, Cl. 371-37.000.

Woodford Manufacturing Company: *See—*
Srajer, Reinhard, 4,554,768, Cl. 52-173.0DS.

Woodworth, Larry A.: *See—*
Boeckmann, Eduard F. B.; and Woodworth, Larry A., 4,555,597, Cl. 179-90.00B.

Wooster Brush Company, The: *See—*
Gargas, Eugene F., 4,555,337, Cl. 210-238.000.

Wright, Allen J., to Intelledex Incorporated. Robot arm with split wrist motion. 4,555,217, Cl. 414-735.000.

Wright, David E., to Dynacast International Limited. Method and apparatus for forming an internally screw-threaded article. 4,554,962, Cl. 164-132.000.

Wright, Eric, to General Signal Corporation. Brake control system for vehicles. 4,555,766, Cl. 364-426.000.

Wright Line, Inc.: *See—*
Ermanski, Albert G., 4,555,081, Cl. 248-183.000.

Wright, William B., Jr.; and Press, Jeffery B., to American Cyanamid Company. Thromboxane synthetase enzyme inhibiting N-[(1H-imidazol-1-yl) and (1H-1,2,4-triazol-1-yl)alkyl]pyridinecarboxamides. 4,555,519, Cl. 514-340.000.

Wronski, Christopher: *See—*
Deckman, Harry W.; Witzke, Horst; Wronski, Christopher; and Yablonovitch, Eli, 4,554,727, Cl. 29-572.000.

Wrulich, Herwig; Schetina, Otto; Siebenhofer, Gottfried; and Maier, Wilfried, to Voest-Alpine Aktiengesellschaft. Apparatus for cutting rock. 4,555,143, Cl. 299-81.000.

Wu, Mu T.: *See—*
Patchett, Arthur A.; and Wu, Mu T., 4,555,502, Cl. 514-19.000.

Wunderlich, Klaus: *See—*
Schutze, Detlef-Ingo; Schmitz, Reinold; and Wunderlich, Klaus, 4,555,580, Cl. 549-52.000.

Wyatt, Kenneth L., to AT&T Technologies, Inc. Method and apparatus utilizing magnetically coupled rollers to feed sheets. 4,555,105, Cl. 271-264.000.

Xerox Corporation: *See—*
Buchar, Wayne A., 4,555,621, Cl. 250-205.000.
Hor, Ah-Mee; and Loutfy, Rafik O., 4,555,463, Cl. 430-59.000.
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,555,785, Cl. 372-8.000.
Tuhro, Richard H., 4,555,732, Cl. 358-213.000.

Xidex Corporation: *See—*
Tanck, Elinor J., 4,555,437, Cl. 428-212.000.

Y.S. Securities Limited: *See—*
Mennell, Thomas W., 4,555,602, Cl. 200-50.0AA.

Yablonovitch, Eli: *See—*
Deckman, Harry W.; Witzke, Horst; Wronski, Christopher; and Yablonovitch, Eli, 4,554,727, Cl. 29-572.300.

Yakushiji, Yasuhiro: *See—*
Matsuura, Shigeo; Ito, Uji; and Yakushiji, Yasuhiro, 4,555,702, Cl. 340-825.640.

Yamada, Hideaki; and Ryuno, Koitchiro, to Nitto Kagaku Kogyo Kabushiki Kaisha; and Hideaki Yamada. Method for cultivation of Pseudomonas bacteria. 4,555,487, Cl. 435-253.000.

Yamada, Hitoshi: *See—*
Nishihata, Ken; Iinuma, Katsuharu; Yamada, Hitoshi; Hirano, Fumiya; and Tsuruoka, Takashi, 4,555,404, Cl. 514-201.000.

Yamada, Junichi: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,555,351, Cl. 252-8.55D.

Yamada, Koji: *See—*
Matsuda, Yuzuru; Iwahashi, Kazuyuki; Iida, Takao; Hirayama, Noriaki; Asano, Kozo; Shuto, Katsuichi; Yamada, Koji; Shirahata, Kunikatsu; and Kase, Hiroshi, 4,555,402, Cl. 424-122.000.

Yamada, Sadami: *See—*
Tamura, Kaoru; and Yamada, Sadami, 4,555,213, Cl. 414-412.000.

Yamada, Tadayuki: *See—*
Miyagawa, Michiaki; Ohki, Kouichi; Takaya, Matsuhiko; Fujihara, Naoto; and Yamada, Tadayuki, 4,555,801, Cl. 382-44.000.

Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, to Nippon Kokan Kabushiki Kaisha. Exhaust valve for Diesel engine and production thereof. 4,554,897, Cl. 123-188.0AA.

Yamada, Takemi; Satoh, Tamataro; Mizushina, Masaaki; Toyota, Koji; and Okamoto, Hiromi, to Nippon Kokan Kabushiki Kaisha. Exhaust valve for diesel engine and production thereof. 4,554,898, Cl. 123-188.0AA.

Yamada, Yasuyuki; Tanaka, Tadaaki; Tukahara, Ryoichi; and Nishizawa, Tsutomu, to Mitsui Toatsu Chemicals, Inc. Composition for liquid crystal color display. 4,555,355, Cl. 252-299.100.

Yamaga, Katsuji: *See—*
Orikasa, Wataru; Tochimoto, Kunio; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; and Saito, Hiroshi, 4,555,286, Cl. 156-94.000.
Orikasa, Wataru; Ohara, Makoto; Mori, Tomoyuki; Shigetomi, Masayoshi; Yamaga, Katsuji; Matsui, Masaaki; Saito, Hiroshi; and Soda, Hiroshi, 4,555,295, Cl. 156-349.000.

Yamagishi, Shigeru: *See—*
Hiroyasu, Minoru; Yamashita, Hideo; Ohguro, Tamotsu; Yamagishi, Shigeru; and Shino, Shigenari, 4,555,205, Cl. 408-150.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
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Yamamoto, Diane M.: *See—*
Stout, David M.; Yamamoto, Diane M.; and Barcelon-Yang, Cynthia, 4,555,517, Cl. 514-336.000.

Yamamoto, Misao: *See—*
Maki, Hirohisa; Sano, Takashi; and Yamamoto, Misao, 4,555,536, Cl. 524-66.000.

Yamamuro, Kiyohiko: *See—*
Inoue, Noriyuki; Okazaki, Masaki; Yamamuro, Kiyohiko; and Takei, Haruo, 4,555,482, Cl. 430-574.000.

Yamanaka, Kimio, to Mitsubishi Denki Kabushiki Kaisha. Plant controller simulator with structure for combining simuation signals with actual process I/O signals. 4,555,756, Cl. 364-130.000.

Yamane, Akiyoshi. Process for the production of controlled freezing point dried foods. 4,555,410, Cl. 426-384.000.

Yamashita, Hideo: *See—*
Hiroyasu, Minoru; Yamashita, Hideo; Ohguro, Tamotsu; Yamagishi, Shigeru; and Shino, Shigenari, 4,555,205, Cl. 408-150.000.

Yamauchi, Mineo: *See—*
Kawasaki, Sadanobu; Yamauchi, Mineo; and Akada, Masanori, 4,555,427, Cl. 428-195.000.

Yamazaki, Shunpei. Printing member for electrostatic photocopying. 4,555,462, Cl. 430-57.000.

Yamoto, Hisayoshi: *See—*
Osawa, Shigeru; and Yamoto, Hisayoshi, 4,554,961, Cl. 152-410.000.

Yanagishima, Takayuki; and Seko, Yasutoshi, to Nissan Motor Company, Limited. Display device for a vehicle. 4,555,694, Cl. 340-524.000.

Yang, Yaw Kuen. Combination locking device for suitcases. 4,554,809, Cl. 70-312.000.

Yanmar Diesel Engine Co., Ltd.: *See—*
Amemori, Koichi; and Kawabe, Toshihiko, 4,554,892, Cl. 123-41.82R.

Yano, Masao: *See—*
Matsumura, Susumu; Hosokawa, Yasuhiko; Katsuki, Kanji; and Yano, Masao, 4,555,750, Cl. 363-37.000.

Yano, Mitsuru, to Seisan Nippon Sha, Ltd. Method of and means for bonding synthetic resin profiled fasteners to film substrate. 4,555,282, Cl. 156-66.000.

Yano, Takashi; and Asami, Masahiro, to Daicel Chemical Industries, Ltd. Photosensitive diazonium material with precoat of graft polymer prepared by grafting cellulose derivation with radical polymerizable monomer. 4,555,468, Cl. 430-160.000.

Yaoka, Osamu: *See—*
Goto, Kazuhiro; Yaoka, Osamu; and Oe, Takanori, 4,555,510, Cl. 514-291.000.

Yasuda, Haruo; Yoshida, Kunihiko; Iwai, Yasuro; and Mizutani, Takayuki, to Ibigawa Electric Industry Company, Ltd. Carbon rod assembly for arc gouging and blasting of metallic article. 4,555,615, Cl. 219-145.210.

Yasuda, Masatoshi: *See—*
Tahara, Yoshiyuki; Takahashi, Toshihiro; Koyama, Hiroyasu; Suzuki, Yoshikuni; and Yasuda, Masatoshi, 4,555,365, Cl. 260-404.000.

Yasuda, Satoshi: *See—*
Nakagome, Hideki; and Yasuda, Satoshi, 4,554,790, Cl. 62-3.000.

Yasue, Kazo, to Anmin Manufacturing Co., Ltd. Filling material. 4,555,421, Cl. 428-6.000.

Yasufuku, Yoshitaka: *See—*
Kikugawa, Shozo; and Yasufuku, Yoshitaka, 4,555,443, Cl. 428-336.000.

Yasui, Tokumasa: *See—*
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Yeung, Edward S.: *See—*
Spurlin, Stanford R.; and Yeung, Edward S., 4,555,491, Cl. 436-120.000.

Yoakam, David; Campbell, Robert; and Pehkonen, Robert, to Vector Corporation. Apparatus for coating tablets with computer control. 4,554,887, Cl. 118-666.000.

Yokoyama, Eisuke, to Kawaguchiko Seimitsu Company Limited. Link for watch band and bracelet. 4,554,783, Cl. 59-82.000.

Yokoyama, Shigeki; Nakamura, Koki; Kouda, Jyounichi; and Sekiguchi, Nobuhisa, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material containing a polyoxyethylene surfactant and a nitron compound. 4,555,480, Cl. 430-527.000.

Yoshida, Hajime, to Hajime Industries, Ltd. Surface flaw inspection apparatus for a convex body. 4,555,635, Cl. 250-572.000.

Yoshida, Kunihiko: *See*—
Yasuda, Haruo; Yoshida, Kunihiko; Iwai, Yasuro; and Mizutani, Takayuki, 4,555,615, Cl. 219-145.210.

Yoshida, Tadashi: *See*—
Obata, Keigo; Dohi, Nobuyasu; Okuhama, Yoshiaki; Masaki, Seishi; Okada, Yukiyoshi; and Yoshida, Tadashi, 4,555,314, Cl. 204-44.400.

Yoshida, Tadayuki, to Sankyo Yuki Kabushiki Kaisha; and Arai Shoji Kabushiki Kaisha. Method of treatment for separation of oil from oil-containing slurry waste. 4,555,345, Cl. 210-705.000.

Yoshida, Yoshio: *See*—
Hirooka, Hiroshi; Yoshida, Yoshio; Fukushi, Toshio; Takeya, Yasuo; and Nagai, Satoshi, 4,554,805, Cl. 68-12.00R.

Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohara, Minoru; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for the treatment of hyperglycemia using p-aminobenzoate-N-L-rhamnoside. 4,555,505, Cl. 514-42.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Goto, Kazuhiro; Yaoka, Osamu; and Oe, Takanori, 4,555,510, Cl. 514-291.000.

Yoshiyama, Toshio: *See*—
Iseki, Masahide; Yoshiyama, Toshio; Kajita, Hiroshi; Itakiyo, Masanori; Kusumoto, Hiroshi; Kawamori, Yoshizo; and Kawamoto, Masuo, 4,555,173, Cl. 355-3.00R.

Yoshizawa, Hiroyuki: *See*—
Maehara, Toshifumi; and Yoshizawa, Hiroyuki, 4,555,145, Cl. 303-92.000.

You, Chin-San. Golf club head construction. 4,555,115, Cl. 273-167.00R.

You, Young S., to Hewlett-Packard Company. Anti-wetting in fluid nozzles. 4,555,062, Cl. 239-690.000.

Young, Ian R., to Picker International, Ltd. Nuclear magnetic resonance imaging method. 4,554,925, Cl. 128-653.000.

Yuchi, Sadataka: *See*—
Machida, Haruchika; and Yuchi, Sadataka, 4,555,695, Cl. 340-538.000.

Yuki, Heimei; and Okamoto, Yoshio, to Daicel Chemical Industries, Ltd. Methacrylic ester useful as an optical resolving agent. 4,555,574, Cl. 546-342.000.

Zanis, Charles A.: *See*—
Morris, Richard A.; Lukens, William E.; and Zanis, Charles A., 4,555,614, Cl. 219-130.010.

Zappia, Jean M.: *See*—
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., 4,555,541, Cl. 524-180.000.

Zayat, Charles. Rotary resurfacing tool. 4,554,957, Cl. 144-2.00R.

Zeisberg, Peter: *See*—
Ploch, Siegfrid; Rossler, Sonja; Zeisberg, Peter; and Heilmann, Horst, 4,554,804, Cl. 66-214.000.

Zeisse, Carl R.: *See*—
Collins, David A.; Lile, Derek L.; and Zeisse, Carl R., 4,555,273, Cl. 148-1.500.

Ziemer, Wolf; and Holle, Wilhelm, to Flakt Aktiebolag. Ceiling construction for clean rooms. 4,554,766, Cl. 52-28.000.

Zilber, Sam: *See*—
Rifkin, Gary L.; Lawrence, Charles C.; Zilber, Sam; and Hamby, Michael, 4,555,749, Cl. 362-249.000.

Zimmer, John C. Apparatus for compacting refuse with stabilizers. 4,554,868, Cl. 100-229.00R.

Zimmermann, Klaus-Dieter: *See*—
Straubel, Max; and Zimmermann, Klaus-Dieter, 4,554,903, Cl. 123-575.000.

Zinchuk, Michael, to Polaroid Corporation. Electronic imaging camera with microchannel plate. 4,555,731, Cl. 358-209.000.

Zink, Rudolf; and Fletcher, Ian J., to Ciba-Geigy Corporation. Chromogenic quinazolines. 4,555,569, Cl. 544-105.000.

Zipes, Douglas P.: *See*—
Prystowsky, Eric N.; and Zipes, Douglas P., 4,554,922, Cl. 128-419.0PG.

Zucchi, Gianfranco: *See*—
Biadigo, Mario; and Zucchi, Gianfranco, 4,555,229, Cl. 425-267.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF NOVEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bagley, Alan S., to Hewlett-Packard Company. Calculator apparatus with electronically alterable key symbols. Re. 32,040, Cl. 364-900.000.

Clear, Theodore E. Methods for manufacturing cementitious reinforced panels. Re. 32,037, Cl. 156-44.000.

Clear, Theodore E.; and Dinkel, Paul E. Methods for manufacturing cementitious reinforced panels. Re. 32,038, Cl. 156-44.000.

Dennis, Mahlon, to Strata Bit Corporation. Drill bit. Re. 32,036, Cl. 175-329.000.

Dinkel, Paul E.: *See*—
Clear, Theodore E.; and Dinkel, Paul E., Re. 32,038, Cl. 156-44.000.

Eastman Kodak Company: *See*—
Hollister, Kenneth R.; and Thomas, Harold T., Re. 32,039, Cl. 430-14.000.

Friedrich Wilh. Schwing, GmbH: *See*—
Heckmann, Horst; and Nawroth, Werner, Re. 32,041, Cl. 137-454.200.

Heckmann, Horst; and Nawroth, Werner, to Friedrich Wilh. Schwing, GmbH. Control valve for viscous material pumps. Re. 32,041, Cl. 137-454.200.

Hewlett-Packard Company: *See*—
Bagley, Alan S., Re. 32,040, Cl. 364-900.000.

Hollister, Kenneth R.; and Thomas, Harold T., to Eastman Kodak Company. Thermal and mechanical barrier layers for optical recording elements. Re. 32,039, Cl. 430-14.000.

Nawroth, Werner: *See*—
Heckmann, Horst; and Nawroth, Werner, Re. 32,041, Cl. 137-454.200.

Strata Bit Corporation: *See*—
Dennis, Mahlon, Re. 32,036, Cl. 175-329.000.

Thomas, Harold T.: *See*—
Hollister, Kenneth R.; and Thomas, Harold T., Re. 32,039, Cl. 430-14.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Atwater, Charles B., to Syntex Inc. Buffered solutions which have a reduced corrosive nature. B1 4,401,624, 11-26-85, Cl. 422-12.000.

Syntex Inc.: *See*—
Atwater, Charles B., B1 4,401,624, Cl. 422-12.000.

LIST OF DESIGN PATENTEES

ALZA Corporation: *See*—
Peery, John R.; and Eckenhoff, James B., 281,528, Cl. D24-8.000.

American Screen Printing Company: *See*—
Bubley, Henry J., 281,510, Cl. D18-13.000.

American Tourister, Inc.: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,465, Cl. D3-71.000.

Ashton, Christopher J., to Marler Haley ExpoSystems, Limited. Portable sign and stand therefor. 281,513, 11-26-85, Cl. D20-21.000.

Astronics Corporation: *See*—
Braunschweig, Peter M.; and Ruffles, Thomas J., Jr., 281,475, Cl. D6-426.000.

Atkinson, Robert W.; and Olson, Daniel H., to Snyder Laboratories, Inc. Combined medical suction and lavage handpiece or the like. 281,535, 11-26-85, Cl. D24-51.000.

Ault, Charles M.: *See*—
Prager, Jay M.; Gonzales, Roman Y.; and Ault, Charles M., 281,493, Cl. D13-40.000.

Barber, Jack: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,465, Cl. D3-71.000.

Batts, John H., to John Thomas Batts, Inc. Garment hanger. 281,470, 11-26-85, Cl. D6-319.000.

Behring, Alexander. Illuminated telephone handset support attachment. 281,497, 11-26-85, Cl. D14-59.000.

Bell, Max: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,465, Cl. D3-71.000.

Bergmans, Charles, to Clarks of England, Inc. Shoe sole. 281,461, 11-26-85, Cl. D2-320.000.

Bivouac Industries, Inc.: *See*—
Chapman, Scott T., 281,487, Cl. D12-156.000.

Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, to American Tourister, Inc. Soft-sided garment bag. 281,465, 11-26-85, Cl. D3-71.000.

Braunschweig, Peter M.; and Ruffles, Thomas J., Jr., to Astronics Corporation. Desk for filing cancelled checks. 281,475, 11-26-85, Cl. D6-426.000.

Bridgestone Tire Company Limited: *See*—
Motomura, Kenichi; and Mamada, Mamoru, 281,485, Cl. D12-142.000.

Brucoli, Michael, to Holson Company, The. Photo album or similar article. 281,511, 11-26-85, Cl. D19-26.000.

Bubley, Henry J., to American Screen Printing Company. Screen printing press. 281,510, 11-26-85, Cl. D18-13.000.

Buhl Industries, Inc.: *See*—
DeLongis, Vincent E.; and Kyhl, Henry, 281,506, Cl. D16-24.000.

Cenefels, Jaime F., to Raivi S.A. Heating plate. 281,526, 11-26-85, Cl. D23-123.000.

Chan-Foun, Lee. Brush for cleaning venetian blind. 281,467, 11-26-85, Cl. D4-119.000.

Chapman, Scott T., to Bivouac Industries, Inc. Pick-up truck tonneau cover. 281,487, 11-26-85, Cl. D12-156.000.

Chen, Tung S. Housing for a telephone set. 281,496, 11-26-85, Cl. D14-53.000.

Chipman-Union, Inc.: *See*—
Keenan, Paul B.; and Fisher, Barry T., 281,468, Cl. D6-317.000.

Clarks of England, Inc.: *See*—
Bergmans, Charles, 281,461, Cl. D2-320.000.

Collins, John, to Leer, Incorporated. Cap for the bed of a pick-up truck. 281,488, 11-26-85, Cl. D12-156.000.

Commodore Business Machines Inc.: *See*—
Velinsky, Ira L., 281,503, Cl. D14-111.000.

Connoisseurs Products Corporation: *See*—
Harrison, Mark, 281,539, Cl. D32-1.000.

Davis, Myron F.; Jordan, Willis Y., III; and Wysong, Robert, to International Business Machines Corporation. Program cartridge for a personal computer. 281,504, 11-26-85, Cl. D14-114.000.

Deacon & Co. Limited: *See*—
Wong, Dennis C. L., 281,516, Cl. D21-59.000.

DeLongis, Vincent E.; and Kyhl, Henry, to Buhl Industries, Inc. Overhead projector. 281,506, 11-26-85, Cl. D16-24.000.
Dickes, Theodore W., to Standard-Knapp, Inc. Design for a packing tray. 281,484, 11-26-85, Cl. D9-432.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Soederberg, Richard, 281,472, Cl. D6-356.000.
Drake, Craig D., to Ring King Visibles, Inc. Storage tray for diskettes or the like. 281,464, 11-26-85, Cl. D3-35.000.
Dunlop Limited: *See*—
Pope, Nicholas J., 281,462, Cl. D2-320.000.
Eckenhoff, James B.: *See*—
Peery, John R.; and Eckenhoff, James B., 281,528, Cl. D24-8.000.
Ehmke, Robert J. Corner fireplace doors and panel. 281,527, 11-26-85, Cl. D23-128.000.
Ehrlich, Samuel J. Golf putter head. 281,522, 11-26-85, Cl. D21-219.000.
Electronic Sports Collection (Far East) Limited, The: *See*—
Sujanani, Vinod S., 281,494, Cl. D14-5.000.
Faidide, Christian, to S.A.R.L. Wichard. Nap-hook for sail-surfing boards. 281,483, 11-26-85, Cl. D8-367.000.
Fisher, Barry T.: *See*—
Keenan, Paul B.; and Fisher, Barry T., 281,468, Cl. D6-317.000.
Geiser, Michel B., to Haute Fourneau et Fonderies de Cousances. Grill. 281,481, 11-26-85, Cl. D7-361.000.
General Electric Company: *See*—
Wheeler, William C., 281,502, Cl. D14-102.000.
General Motors Corporation: *See*—
Schinella, John R., 281,491, Cl. D12-211.000.
Gilbert, Robert W., to Mining Supplies (Minsup) Pty. Ltd. Resilient ring for fluid coupling. 281,525, 11-26-85, Cl. D23-47.000.
Gonzales, Roman Y.: *See*—
Prager, Jay M.; Gonzales, Roman Y.; and Ault, Charles M., 281,493, Cl. D13-40.000.
Gould Inc.: *See*—
Prager, Jay M.; Gonzales, Roman Y.; and Ault, Charles M., 281,493, Cl. D13-40.000.
Hancock, Roy T. Convertible coupler. 281,489, 11-26-85, Cl. D12-162.000.
Handi-Pac, Inc.: *See*—
Klawitter, Ronald R., 281,515, Cl. D21-48.000.
Harris, William H. Tooth crown remover. 281,531, 11-26-85, Cl. D24-10.000.
Harrison, Mark, to Connoisseurs Products Corporation. Electrosonic cleaning bath enclosure. 281,539, 11-26-85, Cl. D32-1.000.
Hattori, Shigeru, to Honda Giken Kogyo Kabushiki Kaisha. Fuel tank for motorcycle. 281,486, 11-26-85, Cl. D12-155.000.
Haute Fourneau et Fonderies de Cousances: *See*—
Geiser, Michel B., 281,481, Cl. D7-361.000.
Hogan, Kevin P.: *See*—
Roberts, Patrick J.; and Hogan, Kevin P., 281,458, Cl. D2-313.000.
Holson Company, The: *See*—
Brucoli, Michael, 281,511, Cl. D19-26.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hattori, Shigeru, 281,486, Cl. D12-155.000.
Yaguchi, Tadahiro, 281,492, Cl. D13-2.000.
Honermann, John R. Stocking holder. 281,469, 11-26-85, Cl. D6-317.000.
Inaba, Hiroshi, to Nippon Tsushin Kogyo Kabushiki Kaisha. Push button. 281,498, 11-26-85, Cl. D14-59.000.
Interlego A.G.: *See*—
Pedersen, Niels M., 281,519, Cl. D21-165.000.
International Business Machines Corporation: *See*—
Davis, Myron F.; Jordan, Willis Y., III; and Wysong, Robert, 281,504, Cl. D14-114.000.
IPCO Corporation: *See*—
Weissman, Bernard, 281,532, Cl. D24-10.000.
John Thomas Batts, Inc.: *See*—
Batts, John H., 281,470, Cl. D6-319.000.
Jolliffe, John E., to SCM Corporation. Typewriter. 281,509, 11-26-85, Cl. D18-1.000.
Jordan, Willis Y., III: *See*—
Davis, Myron F.; Jordan, Willis Y., III; and Wysong, Robert, 281,504, Cl. D14-114.000.
Keenan, Paul B.; and Fisher, Barry T., to Chipman-Union, Inc. Hosiery hanger. 281,468, 11-26-85, Cl. D6-317.000.
Kenncorp Sports, Inc.: *See*—
Stalberger, Robert J., Jr.; and Kennedy, LeRoy F., 281,521, Cl. D21-203.000.
Kennedy, LeRoy F.: *See*—
Stalberger, Robert J., Jr.; and Kennedy, LeRoy F., 281,521, Cl. D21-203.000.
Kiiski, Heikki A., to Tunturipyora Oy. Bicycle exerciser. 281,520, 11-26-85, Cl. D21-194.000.
Kindt-Larsen, Ture: *See*—
Larsen, Hans O.; and Kindt-Larsen, Ture, 281,505, Cl. D15-136.000.
Klawitter, Ronald R., to Handi-Pac, Inc. Game console. 281,515, 11-26-85, Cl. D21-48.000.
Kobori, Akio, to Sailor Pen Co., Ltd., The. Nib for a fountain pen. 281,512, 11-26-85, Cl. D19-55.000.
Kolich, Robert A., to Quaker Oats Company, The. Toy telephone. 281,517, 11-26-85, Cl. D21-111.000.
Kyhl, Henry: *See*—
DeLongis, Vincent E.; and Kyhl, Henry, 281,506, Cl. D16-24.000.
Larsen, Hans O.; and Kindt-Larsen, Ture, to Mia Lens Production A/S. Molding frame for lenses. 281,505, 11-26-85, Cl. D15-136.000.
Leer, Incorporated: *See*—
Collins, John, 281,488, Cl. D12-156.000.
Lenhart, Richard D.; and Lindblad, Roger D., to Zot Manufacturing Company. Pin setter return track mounting bridge. 281,523, 11-26-85, Cl. D21-233.000.
Lien, Paul. License plate holder and display device. 281,490, 11-26-85, Cl. D12-193.000.
Lindblad, Roger D.: *See*—
Lenhart, Richard D.; and Lindblad, Roger D., 281,523, Cl. D21-233.000.
Makihara, Kendo: *See*—
Yamagata, Hiroshi; and Makihara, Kendo, 281,500, Cl. D14-92.000.
Yamagata, Hiroshi; and Makihara, Kendo, 281,501, Cl. D14-92.000.
Mamada, Mamoru: *See*—
Motomura, Kenichi; and Mamada, Mamoru, 281,485, Cl. D12-142.000.
Marler Haley ExpoSystems, Limited: *See*—
Ashton, Christopher J., 281,513, Cl. D20-21.000.
McClelland, Donald R., to Rubbermaid Incorporated. Combined casserole dish and roasting rack. 281,480, 11-26-85, Cl. D7-356.000.
McKinney, Thomas H., III. Capo for a stringed musical instrument. 281,508, 11-26-85, Cl. D17-20.000.
Mentor O & O, Inc.: *See*—
Seager, Richard, 281,533, Cl. D24-17.000.
Messmer, Steven R.; and Pryor, Dean A. Game board. 281,514, 11-26-85, Cl. D21-31.000.
Mia Lens Production A/S: *See*—
Larsen, Hans O.; and Kindt-Larsen, Ture, 281,505, Cl. D15-136.000.
Mining Supplies (Minsup) Pty. Ltd.: *See*—
Gilbert, Robert W., 281,525, Cl. D23-47.000.
Minsky, Richard. Ring cushion memento chest. 281,466, 11-26-85, Cl. D3-78.000.
Monier Limited: *See*—
O'Donnell, Daniel, 281,536, Cl. D25-80.000.
Moorkens, Pierre A. R. J. M. G. Combined bed and desk-table. 281,474, 11-26-85, Cl. D6-384.000.
Motomura, Kenichi; and Mamada, Mamoru, to Bridgestone Tire Company Limited. Vehicle tire. 281,485, 11-26-85, Cl. D12-142.000.
Motorola, Inc.: *See*—
Nagele, Albert L., 281,499, Cl. D14-76.000.
Nagele, Albert L., to Motorola, Inc. Radio base mounting unit or similar article. 281,499, 11-26-85, Cl. D14-76.000.
Neff, Paul J. Rack. 281,477, 11-26-85, Cl. D6-574.000.
Nike, Inc.: *See*—
Parker, Mark G., 281,459, Cl. D2-320.000.
Parker, Mark G., 281,460, Cl. D2-320.000.
Nippon Tsushin Kogyo Kabushiki Kaisha: *See*—
Inaba, Hiroshi, 281,498, Cl. D14-59.000.
Nottingham, John R.; and Spirk, John W., Jr. Combined toy wagon and animals therefor. 281,518, 11-26-85, Cl. D21-149.000.
O'Donnell, Daniel, to Monier Limited. Roof tile. 281,536, 11-26-85, Cl. D25-80.000.
Olson, Daniel H.: *See*—
Atkinson, Robert W.; and Olson, Daniel H., 281,535, Cl. D24-51.000.
Olympus Optical Co., Ltd.: *See*—
Ushikubo, Masao, 281,534, Cl. D24-29.000.
Padmore & Barnes International Limited: *See*—
Roberts, Patrick J.; and Hogan, Kevin P., 281,458, Cl. D2-313.000.
Parker, Mark G., to Nike, Inc. Shoe outsole. 281,459, 11-26-85, Cl. D2-320.000.
Parker, Mark G., to Nike, Inc. Shoe outsole. 281,460, 11-26-85, Cl. D2-320.000.
Pedersen, Niels M., to Interlego A.G. Toy horse figure. 281,519, 11-26-85, Cl. D21-165.000.
Peery, John R.; and Eckenhoff, James B., to ALZA Corporation. Body mounted pump for dispensing medication. 281,528, 11-26-85, Cl. D24-8.000.
Po, Chan K. Shoe. 281,457, 11-26-85, Cl. D2-310.000.
Ponticelli, Pasco C. Adapter for mounting loudspeakers. 281,495, 11-26-85, Cl. D14-37.000.
Poon, Tit-Wing. Combined lamp and torch. 281,537, 11-26-85, Cl. D26-42.000.
Pope, Nicholas J., to Dunlop Limited. Shoe sole. 281,462, 11-26-85, Cl. D2-320.000.
Prager, Jay M.; Gonzales, Roman Y.; and Ault, Charles M., to Gould Inc. Input/output module for programmable controller. 281,493, 11-26-85, Cl. D13-40.000.
Protector Safety Industries Limited: *See*—
Schremmer, Paul M., 281,507, Cl. D16-102.000.
Pryor, Dean A.: *See*—
Messmer, Steven R.; and Pryor, Dean A., 281,514, Cl. D21-31.000.
Pulichino, John: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 281,465, Cl. D3-71.000.
Quaker Oats Company, The: *See*—
Kolich, Robert A., 281,517, Cl. D21-111.000.
Raivi S.A.: *See*—
Cenefels, Jaime F., 281,526, Cl. D23-123.000.
Ring King Visibles, Inc.: *See*—
Drake, Craig D., 281,464, Cl. D3-35.000.
Roberts, Patrick J.; and Hogan, Kevin P., to Padmore & Barnes International Limited. Shoe. 281,458, 11-26-85, Cl. D2-313.000.
Rodrigues, Theodore E. Carrying case for a camera and accessories. 281,463, 11-26-85, Cl. D3-33.000.

Rotpunkt Dr. Anso Zimmermann: *See*—
Zimmermann, Anso, 281,478, Cl. D7-77.000.
Zimmermann, Anso, 281,479, Cl. D7-317.000.
Rubbermaid Incorporated: *See*—
McClelland, Donald R., 281,480, Cl. D7-356.000.
Ruffles, Thomas J., Jr.: *See*—
Braunschweig, Peter M.; and Ruffles, Thomas J., Jr., 281,475, Cl. D6-426.000.
S.A.R.L. Wichard: *See*—
Faidide, Christian, 281,483, Cl. D8-367.000.
Sailor Pen Co., Ltd., The: *See*—
Kobori, Akio, 281,512, Cl. D19-55.000.
Sauter, Daniel S., to Trans World Airlines, Inc. Aircraft passenger seat. 281,471, 11-26-85, Cl. D6-356.000.
Schinella, John R., to General Motors Corporation. Wheel cover. 281,491, 11-26-85, Cl. D12-211.000.
Schremmer, Paul M., to Protector Safety Industries Limited. Spectacles. 281,507, 11-26-85, Cl. D16-102.000.
SCM Corporation: *See*—
Jolliffe, John E., 281,509, Cl. D18-1.000.
Seager, Richard, to Mentor O & O, Inc. Visual acuity meter for measuring the potential visual acuity of the eye of a patient. 281,533, 11-26-85, Cl. D24-17.000.
Seid, Paul; and Wolfe, Herbert, to Sultan Dental Products Ltd. Dental tray. 281,529, 11-26-85, Cl. D24-10.000.
Seid, Paul; and Wolfe, Herbert, to Sultan Dental Products Ltd. Dental tray. 281,530, 11-26-85, Cl. D24-10.000.
Sharp Corporation: *See*—
Yamagata, Hiroshi; and Makihara, Kendo, 281,500, Cl. D14-92.000.
Yamagata, Hiroshi; and Makihara, Kendo, 281,501, Cl. D14-92.000.
Singer, Mark. Chair. 281,473, 11-26-85, Cl. D6-379.000.
Smith, Willard G., Jr. Cabinet for toothbrushes, toothpaste or the like. 281,476, 11-26-85, Cl. D6-559.000.
Snyder Laboratories, Inc.: *See*—
Atkinson, Robert W.; and Olson, Daniel H., 281,535, Cl. D24-51.000.
Soederberg, Richard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Aircraft seat or similar article. 281,472, 11-26-85, Cl. D6-356.000.
Spirk, John W., Jr.: *See*—
Nottingham, John R.; and Spirk, John W., Jr., 281,518, Cl. D21-149.000.
Stalberger, Robert J., Jr.; and Kennedy, LeRoy F., to Kenncorp Sports, Inc. Game footbag. 281,521, 11-26-85, Cl. D21-203.000.
Standard-Knapp, Inc.: *See*—
Dickes, Theodore W., 281,484, Cl. D9-432.000.
Sujanani, Vinod S., to Electronic Sports Collection (Far East) Limited, The. Portable combined cassette player, tuner, amplifier and speakers. 281,494, 11-26-85, Cl. D14-5.000.
Sultan Dental Products Ltd.: *See*—
Seid, Paul; and Wolfe, Herbert, 281,529, Cl. D24-10.000.
Seid, Paul; and Wolfe, Herbert, 281,530, Cl. D24-10.000.
Suzuki, Yoshiaki, to Toko Kogyo Kabushiki Kaisha. Winding reel. 281,482, 11-26-85, Cl. D8-358.000.
Swedarsky, Leonard I.: *See*—
Swedarsky, Lois D.; and Swedarsky, Leonard I., 281,456, Cl. D2-253.000.
Swedarsky, Lois D.; and Swedarsky, Leonard I. Beaded headband. 281,456, 11-26-85, Cl. D2-253.000.
Toko Kogyo Kabushiki Kaisha: *See*—
Suzuki, Yoshiaki, 281,482, Cl. D8-358.000.
Trans World Airlines, Inc.: *See*—
Sauter, Daniel S., 281,471, Cl. D6-356.000.
Tunturipyora Oy: *See*—
Kiiski, Heikki A., 281,520, Cl. D21-194.000.
Ushikubo, Masao, to Olympus Optical Co., Ltd. Container for a sample of liquid serum or the like. 281,534, 11-26-85, Cl. D24-29.000.
Velinsky, Ira L., to Commodore Business Machines Inc. Printer. 281,503, 11-26-85, Cl. D14-111.000.
Wang, Tony. Lamp. 281,538, 11-26-85, Cl. D26-64.000.
Weissman, Bernard, to IPCO Corporation. Dental impression tray. 281,532, 11-26-85, Cl. D24-10.000.
Wheeler, William C., to General Electric Company. Videoconferencing console with multiple video transmitting and receiving devices. 281,502, 11-26-85, Cl. D14-102.000.
Wolfe, Herbert: *See*—
Seid, Paul; and Wolfe, Herbert, 281,529, Cl. D24-10.000.
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Zot Manufacturing Company: *See*—
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CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 26, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2	4,554,681
70	4,554,682
202	4,554,683
227	4,554,684
403	4,554,685

CLASS 4

144.2	4,554,687
191	4,554,688
254	4,554,689
601	4,554,690

CLASS 5

81 R	4,554,691
411	4,554,692
448	4,554,693

CLASS 8

405	4,555,246
	4,555,247

CLASS 12

136 B	4,554,694

CLASS 14

69.5	4,554,695

CLASS 15

21 D	4,554,696
55	4,554,697
201	4,554,699
323	4,554,700
339	4,554,698
340	4,554,701
372	4,554,702
424	4,554,703

CLASS 16

21	4,554,704
110 R	4,554,705
237	4,554,706

CLASS 17

47	4,554,707

CLASS 19

80 R	4,554,708
218	4,554,709

CLASS 24

49 CF	4,554,710
150 FP	4,554,711
241 PP	4,554,712

CLASS 26

51	4,554,713
75	4,554,714

CLASS 28

107	4,554,715
263	4,554,716

CLASS 29

25.35	4,554,717
155 R	4,554,718
157.3 R	4,554,719
402.01	4,554,720
416	4,554,721
426.5	4,554,722
430	4,554,723
451	4,554,724
564.4	4,554,725
571	4,554,726
572	4,554,727
576 W	4,554,728
577 C	4,554,729
605	4,554,730
	4,554,731
620	4,554,732
749	4,554,733
818	4,554,734

CLASS 30

47	4,554,735
120.3	4,554,736
	4,554,737
275	4,554,738

CLASS 33

2 H	4,554,739
25 R	4,554,740
125 C	4,554,741
143 L	4,554,742
172 R	4,554,743
241	4,554,744
257	4,554,745
447	4,554,746
553	4,554,747

CLASS 34

242	4,554,748

CLASS 36

102	4,554,749

CLASS 37

3	4,554,750
234	4,554,751

CLASS 38

61	4,554,752

CLASS 40

341	4,554,753
603	4,554,754

CLASS 43

22	4,554,755
44.99	4,554,756
55	4,554,757
61	4,554,758
100	4,554,759
105	4,554,760

CLASS 44

78	4,555,248

CLASS 47

1.41	4,554,761

CLASS 48

62 R	4,555,249

CLASS 49

76	4,554,762
349	4,554,763
501	4,554,764

CLASS 51

309	4,555,250
401	4,554,765

CLASS 52

28	4,554,766
167	4,554,767
173 DS	4,554,768
173 R	4,554,769
207	4,554,770
221	4,554,771
396	4,554,772
521	4,554,773

CLASS 53

52	4,554,774
64	4,554,775
76	4,554,776
201	4,554,777
398	4,554,778
589	4,554,779

CLASS 55

48	4,555,251
132	4,555,252
170	4,555,253
345	4,555,254
355	4,555,255

CLASS 56

11.8	4,554,780
235	4,554,781

CLASS 57

66	4,554,782

CLASS 59

82	4,554,783

CLASS 60

39.02	4,554,784
314	4,554,785
397	4,554,786
605	4,554,787
646	4,554,788
751	4,554,789

CLASS 62

3	4,554,790
18	4,555,256
55	4,554,791
77	4,554,792
126	4,554,793
150	4,554,794
175	4,554,795
326	4,554,796
434	4,554,797
457	4,554,798
509	4,554,799

CLASS 63

23	4,554,800

CLASS 65

13	4,555,257
319	4,555,258
374.12	4,555,259

CLASS 66

9 B	4,554,801
71	4,554,802
75.2	4,554,803
214	4,554,804

CLASS 68

12 R	4,554,805
257	4,554,806

CLASS 70

208	4,554,807
279	4,554,808
312	4,554,809

CLASS 71

88	4,555,260
90	4,555,261
92	4,555,262
98	4,555,263

CLASS 72

70	4,554,810
110	4,554,811
202	4,554,812
251	4,554,813
345	4,554,814
349	4,554,815
368	4,554,816
370	4,554,817
410	4,554,818

CLASS 73

9	4,554,819
23	4,554,820
55	4,554,821
61 R	4,554,822
116	4,554,823
117	4,554,824
118	4,554,825
170 A	4,554,826
189	4,554,827
202	4,554,828
204	4,554,829
299	4,554,830
304 R	4,554,831
432 R	4,554,832
457	4,554,833
597	4,554,834
640	4,554,835
657	4,554,836
705	4,554,837
761	4,554,838
864.16	4,554,839

CLASS 74

42	4,554,840
200	4,554,841
409	4,554,842
493	4,554,843
606 R	4,554,844
650	4,554,845
805	4,554,846

CLASS 75

46	4,555,267
49	4,555,264
53	4,555,265
	4,555,266
229	4,555,268

CLASS 81

111	4,554,847
447	4,554,848

CLASS 83

40	4,554,849
178	4,554,850
213	4,554,851
407	4,554,852
522	4,554,853

CLASS 84

1.03	4,554,854
1.19	4,554,857
	4,554,858
95 C	4,554,856
122	4,554,855
283	4,554,859

CLASS 89

1.7	4,554,860

CLASS 91

446	4,554,861

CLASS 98

42.21	4,554,862
59	4,554,863

CLASS 99

340	4,554,864
353	4,554,865
499	4,554,866

CLASS 100

3	4,554,867
229 R	4,554,868

CLASS 101

145	4,554,869
365	4,554,870

CLASS 102

489	4,554,871
490	4,554,872

CLASS 104

88	4,554,873
247	4,554,874

CLASS 105

221 R	4,554,875

CLASS 106

90	4,555,269

CLASS 110

246	4,554,876

CLASS 112

105	4,554,877
235	4,554,878
445	4,554,879
454	4,554,880

CLASS 114

39	4,554,881
219	4,554,882
266	4,554,883
344	4,554,884

CLASS 116

174	4,554,885

CLASS 118

42	4,554,886
666	4,554,887

CLASS 119

53	4,554,888

CLASS 122

26	4,554,906
32	4,554,889

CLASS 123

26	4,554,890
41.21	4,554,891
41.82 R	4,554,892
41.83	4,554,893
53 AA	4,554,894
90.55	4,554,895
179 G	4,554,896
188 AA	4,554,897
	4,554,898
357	4,554,899
418	4,554,900
450	4,554,901
557	4,554,902
575	4,554,903

CLASS 124

18	4,554,904
56	4,554,905

CLASS 126

191	4,554,907
443	4,554,908

CLASS 127

44	4,555,270
46.2	4,555,271

CLASS 128

1.2	4,554,909
28	4,554,910
57	4,554,911
80 C	4,554,913
80 E	4,554,912
92 A	4,554,915
92 C	4,554,914
203.12	4,554,916
303.1	4,554,917
360	4,554,919
419 PG	4,554,920
	4,554,921
	4,554,922
421	4,554,923
640	4,554,924
653	4,554,925
663	4,554,926
670	4,554,927
709	4,554,928
772	4,554,929
774	4,554,930

CLASS 131

84.4	4,554,931
296	4,554,932
304	4,554,933

CLASS 132

40	4,554,934
73	4,554,935

CLASS 134

146	4,554,936

CLASS 135

100	4,554,937

CLASS 136

245	4,555,585
259	4,555,586

CLASS 137

82	4,554,938
99	4,554,939
116	4,554,940
240	4,554,941
	4,554,942
242	4,554,943
296	4,554,944
312	4,554,945
384.2	4,554,946
454.2	Re.32,041
596.18	4,554,947
625.31	4,554,948
899	4,554,949

CLASS 139

25	4,554,950
105	4,554,951
302	4,554,952
383 A	4,554,953
439	4,554,954

CLASS 141

1	4,554,955
65	4,554,956

CLASS 144

2 R	4,554,957
4	4,554,958
380	4,554,959

CLASS 148

1.5	4,555,273
3	4,555,272
6.14 R	4,555,274
6.3	4,555,275

CLASS 149

6	4,555,276
19.4	4,555,277
21	4,555,278
92	4,555,279
109.6	4,555,280

CLASS 152

410	4,554,961
450	4,554,960

CLASS 156

44	Re.32,037
	Re.32,038
64	4,555,281
66	4,555,282
71	4,555,283
79	4,555,284
89	4,555,285
94	4,555,286
127	4,555,287
191	4,555,288
203	4,555,289
245	4,555,290
250	4,555,291
279	4,555,292
308.4	4,555,293
309.6	4,555,294
349	4,555,295
446	4,555,296
461	4,555,297
523	4,555,298
552	4,555,299
613	4,555,300
617 R	4,555,301
637	4,555,302
643	4,555,303
663	4,555,304

CLASS 162

205	4,555,305
	4,555,306

CLASS 164

132	4,554,962

CLASS 165

1	4,554,963
39	4,554,964
95	4,554,965
104.21	4,554,966
134.1	4,554,967
144	4,554,968
154	4,554,969
181	4,554,970

CLASS 166

88	4,554,971
137	4,554,972
192	4,554,973
273	4,554,974
297	4,554,975
341	4,554,976

CLASS 172

177	4,554,977
247	4,554,978
813	4,554,979

CLASS 173

12	4,554,980

CLASS 174

11 R	4,555,587
73 R	4,555,588
156	4,555,589

CLASS 175

4.52	4,554,981
75	4,554,982
107	4,554,983
170	4,554,984
329	Re.32,036
371	4,554,985
397	4,554,986

CLASS 177

134	4,554,987
178	4,554,988

CLASS 178

18	4,555,590
22.13	4,555,591

CLASS 179

2 E	4,555,592
18 B	4,555,594
18 ES	4,555,595
18 GD	4,555,593

81 B 4,555,596
90 B 4,555,597
121 D 4,555,598
170 R 4,555,599
184 4,555,600

CLASS 180

65.4 4,554,989
197 4,554,990
243 4,554,991
307 4,554,992

CLASS 181

130 4,554,993

CLASS 182

18 4,554,994
129 4,554,995
199 4,554,996
238 4,554,997

CLASS 184

15.1 4,554,998

CLASS 187

29 R 4,554,999
4,555,000

CLASS 188

79.5 GE 4,555,001

CLASS 192

0.084 4,555,006
45 4,555,002
53 B 4,555,003
58 B 4,555,004
70.27 4,555,005
98 4,555,007
106.1 4,555,008
106.2 4,555,009

CLASS 198

361 4,555,010
444 4,555,011
621 4,555,012
689.1 4,555,013
852 4,555,014

CLASS 200

5 A 4,555,601
50 AA 4,555,602
144 AP 4,555,603
255 4,555,604

CLASS 202

177 4,555,307
263 4,555,308

CLASS 203

1 4,555,309
10 4,555,310
21 4,555,311
29 4,555,312

CLASS 204

3 4,555,313
44.4 4,555,314
52 R 4,555,315
59 R 4,555,316
129 4,555,317
157.1 R 4,555,318
159.21 4,555,319
180.9 4,555,320
224 R 4,555,321
258 4,555,323
284 4,555,324

CLASS 206

0.5 4,555,015
63.3 4,555,016
83.5 4,555,017
214 4,555,018
223 4,555,019
235 4,555,020
387 4,555,021
440 4,555,022
446 4,555,023
454 4,555,024
497 4,555,025
521 4,555,026
626 4,555,027

CLASS 208

10 4,555,325
48 R 4,555,326
108 4,555,327
157 4,555,328

CLASS 209

5 4,555,329
254 4,555,330
599 4,555,028

CLASS 210

99 4,555,331
104 4,555,332
113 4,555,333
169 4,555,334
192 4,555,335
232 4,555,336
238 4,555,337
242.4 4,555,338
244 4,555,339
248 4,555,340
359 4,555,341
488 4,555,342
643 4,555,343
670 4,555,344
705 4,555,345
734 4,555,346
752 4,555,347

CLASS 211

22 4,555,029
49.1 4,555,030

CLASS 212

189 4,555,031
4,555,032

CLASS 213

51 4,555,033

CLASS 215

100 R 4,555,034
215 4,555,035
220 4,555,036
232 4,555,037
235 4,555,038
252 4,555,039
365 4,555,040

CLASS 219

10.55 E 4,555,605
10.55 R 4,555,606
10.57 4,555,607
10.77 4,555,608
121 4,555,611
121 LA 4,555,610
121 P 4,555,612
121 PC 4,555,609
124.34 4,555,613
130.01 4,555,614
145.21 4,555,615
432 4,555,616

CLASS 220

204 4,555,041
277 4,555,042
306 4,555,043

CLASS 221

19 4,555,044

CLASS 222

1 4,555,045
189 4,555,046
192 4,555,047
478 4,555,048
517 4,555,049
597 4,555,050

CLASS 224

150 4,555,051

CLASS 228

104 4,555,052
107 4,555,053
148 4,555,054
155 4,555,055

CLASS 229

45 R 4,555,056

CLASS 235

379 4,555,617
384 4,555,618
492 4,555,619

CLASS 236

94 4,555,057

CLASS 239

223 4,555,058
425 4,555,059
585 4,555,060
675 4,555,061
690 4,555,062

CLASS 241

46.04 4,555,063
89.3 4,555,064
241 4,555,065
293 4,555,066

CLASS 242

35.5 A 4,555,067
36 4,555,068
43 R 4,555,069
58.1 4,555,070
75.5 4,555,071
84.5 R 4,555,072
86.5 R 4,555,073
107.4 A 4,555,074
4,555,075
195 4,555,076
198 4,555,077

CLASS 244

54 4,555,078
207 4,555,079

CLASS 248

27.1 4,555,080
183 4,555,081
220.1 4,555,082
313 4,555,083
460 4,555,084
561 4,555,085

CLASS 249

67 4,555,086
78 4,555,087
192 4,555,088

CLASS 250

205 4,555,620
4,555,621
211 J 4,555,622
214 A 4,555,623
223 R 4,555,624
231 SE 4,555,625
239 4,555,626
334 4,555,627
341 4,555,628
362 4,555,629
492.1 4,555,630
551 4,555,631
560 4,555,632
4,555,633
565 4,555,634
572 4,555,635
578 4,555,636

CLASS 252

1 4,555,348
8.55 D 4,555,350
4,555,351
8.6 4,555,349
35 4,555,352
49.6 4,555,353
90 4,555,354
299.1 4,555,355
400 R 4,555,356
511 4,555,357
516 4,555,358
522 R 4,555,359
541 4,555,360
626 4,555,361

CLASS 254

10 B 4,555,089
29 R 4,555,090
267 4,555,091
291 4,555,092
362 4,555,093

CLASS 260

112.5 R 4,555,362
239.1 4,555,363
397.2 4,555,364
404 4,555,365
404.8 4,555,366
465.9 4,555,367
502.4 R 4,555,368
544 F 4,555,369
545 R 4,555,370

CLASS 261

122 4,555,371

CLASS 264

2.1 4,555,372
25 4,555,373
40.1 4,555,374
259 4,555,375
266 4,555,376
292 4,555,377
4,555,378
310 4,555,379
510 4,555,380
516 4,555,381

CLASS 266

45 4,555,094

CLASS 267

4 4,555,095
8 R 4,555,096
100 4,555,097
140.1 4,555,098

CLASS 269

88 4,555,099
166 4,555,100

CLASS 270

58 4,555,101

CLASS 271

4 4,555,102
35 4,555,103
228 4,555,104
264 4,555,105
297 4,555,106

CLASS 272

63 4,555,107
69 4,555,108
73 4,555,109

CLASS 273

26 B 4,555,111
26 E 4,555,110
77 A 4,555,112
80 B 4,555,113
128 R 4,555,114
167 R 4,555,115
236 4,555,116

CLASS 277

173 4,555,117
188 R 4,555,118
207 R 4,555,119

CLASS 280

6.1 4,555,120
30 4,555,121
87.04 R 4,555,122
160 4,555,123
289 WC 4,555,124
515 4,555,125
707 4,555,126
806 4,555,127

CLASS 281

45 4,555,128

CLASS 285

3 4,555,129
26 4,555,130
91 4,555,131

CLASS 290

52 4,555,637

CLASS 294

1.5 4,555,132
82.24 4,555,133

CLASS 296

189 4,555,134

CLASS 297

105 4,555,135
108 4,555,136
284 4,555,137
346 4,555,138
452 4,555,140
4,555,141
460 4,555,139

CLASS 299

43 4,555,142
81 4,555,143

CLASS 303

92 4,555,144
4,555,145

CLASS 305

10 4,555,146

CLASS 307

10 R 4,555,638
38 4,555,639
115 4,555,640
254 4,555,641
475 4,555,642
476 4,555,643
482 4,555,644

CLASS 308

3.8 4,555,147
6 C 4,555,149
6 R 4,555,148

CLASS 310

27 4,555,645

CLASS 312

250 4,555,150

CLASS 315

5.35 4,555,646
179 4,555,647
241 P 4,555,648
382 4,555,649

CLASS 318

135 4,555,650
341 4,555,651
375 4,555,652
696 4,555,653
751 4,555,654

CLASS 320

1 4,555,655
5 4,555,656
64 4,555,657

CLASS 323

210 4,555,658
4,555,659
224 4,555,660

CLASS 324

61 R 4,555,661
71.4 4,555,662
73 R 4,555,663
225 4,555,664
229 4,555,665

CLASS 326

233 4,555,666

CLASS 329

50 4,555,667

CLASS 330

9 4,555,668
149 4,555,669
252 4,555,670
4,555,671
255 4,555,672
258 4,555,673
267 4,555,674
289 4,555,675
298 4,555,676
302 4,555,677

CLASS 331

1 A 4,555,678
17 4,555,679
86 4,555,680

CLASS 333

112 4,555,681
189 4,555,682
202 4,555,683

CLASS 335

66 4,555,684
303 4,555,685

CLASS 337

102 4,555,686
370 4,555,687
394 4,555,688

CLASS 339

17 CF 4,555,151
4,555,153
17 L 4,555,152
59 R 4,555,154
61 R 4,555,155
75 M 4,555,156
75 MP 4,555,157
99 R 4,555,158
239 4,555,159

CLASS 340

19 R 4,555,689
52 F 4,555,690
52 R 4,555,691
347 AD 4,555,692
365 S 4,555,693
524 4,555,694
538 4,555,695
551 4,555,696
575 4,555,697
680 4,555,698
707 4,555,699
721 4,555,700
736 4,555,701
825.64 4,555,702

CLASS 343

5 SA 4,555,703
7.3 4,555,704
55 A 4,555,705
379 4,555,706
387 4,555,707
799 4,555 ,8

CLASS 346

1.1 4,555,7[illegible]
4,555,71[illegible]
75 4,555,711
4,555,712
4,555,713
76 PH 4,555,714
4,555,715
137 4,555,716
140 R 4,555,717
4,555,718
4,555,719

CLASS 350

103 4,555,161
162.17 4,555,162
172 4,555,163
358 4,555,160
420 4,555,164
429 4,555,165
634 4,555,166

CLASS 352

133 4,555,167

CLASS 353

7 4,555,168

CLASS 354

407 4,555,169
470 4,555,170

CLASS 355

3 CH 4,555,171
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